



## AIRCRAFT MAINTENANCE MANUAL

### HIGHLIGHTS

REVISION NO. 33 Jun 01/10

Pages which have been revised are outlined below, together with the Highlights of the Revision

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CH/SE/SU C  
PAGES

REASON FOR CHANGE

EFFECTIVITY  
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#### CHAPTER 74

L.E.P. 1- 1 Revised to Reflect this revision indicating  
new, revised, and/or deleted pages

# AIRCRAFT MAINTENANCE MANUAL

## CHAPTER 74

### IGNITION

#### LIST OF EFFECTIVE PAGES

N, R or D indicates pages which are New, Revised or Deleted respectively  
Remove and insert the affected pages and complete the Record of Revisions and  
the Record of Temporary Revisions as necessary

| CH/SE/SU | C    | PAGE | DATE     | CH/SE/SU | C | PAGE | DATE     | CH/SE/SU | C | PAGE | DATE |
|----------|------|------|----------|----------|---|------|----------|----------|---|------|------|
| RECORD   |      |      |          | 74-21-01 |   | 408  | Jun01/04 |          |   |      |      |
| OF TEMP. |      |      |          | 74-21-01 |   | 409  | Jun01/04 |          |   |      |      |
| REVISION |      |      |          | 74-21-01 |   | 410  | Jun01/04 |          |   |      |      |
|          |      |      |          | 74-21-01 |   | 411  | Jun01/04 |          |   |      |      |
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| T. of C. |      | 1    | Jun01/04 | 74-21-01 |   | 601  | Jun01/04 |          |   |      |      |
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**AIRCRAFT MAINTENANCE MANUAL**

**GENERAL/DESCRIPTION AND OPERATION**

**1. General**

The engine ignition circuit comprises two independent systems A and B. Each separate system is capable of igniting the fuel/air mixture in the combustion chamber. Each circuit consists of an ignition exciter supplied with 115 V - 400 Hz, a high energy lead and an igniter plug.

The ignition circuit is controlled from ENG START panel (429VU) located in the center of flight compartment overhead panel.

The use of the ignition system is limited to the following operations :

- engine starting
- engine relight in flight
- adverse flight conditions (continuous ignition).

It is recommended that each system be energized alternatively, in order to maximize igniter life.

**NOTE** : Special care shall be taken when handling igniter plugs  
(Ref. 74-21-00).

**2. Component Location** (Ref. Fig. 001)

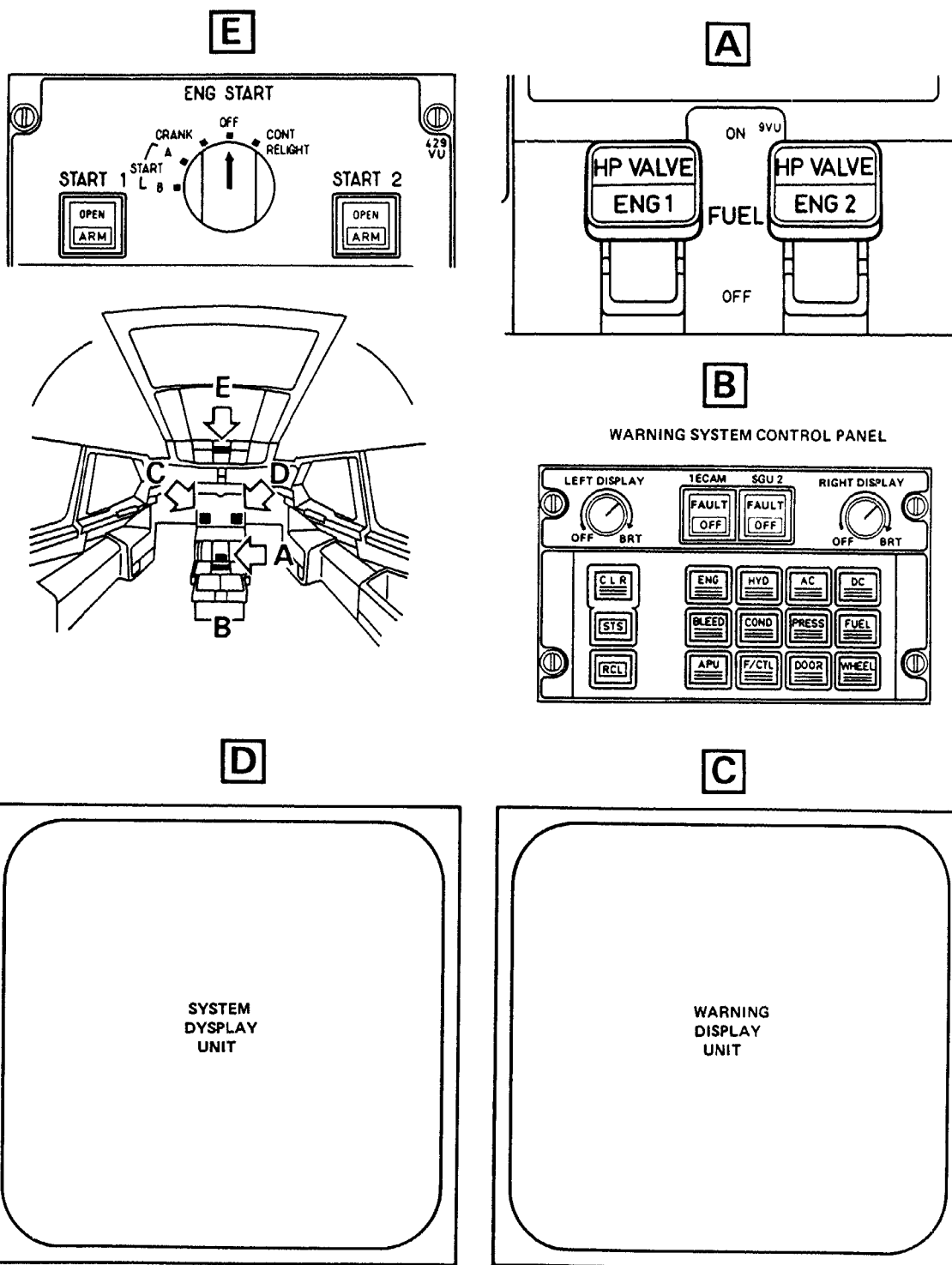
**3. Electrical Supply**  
(Ref. Fig. 002)

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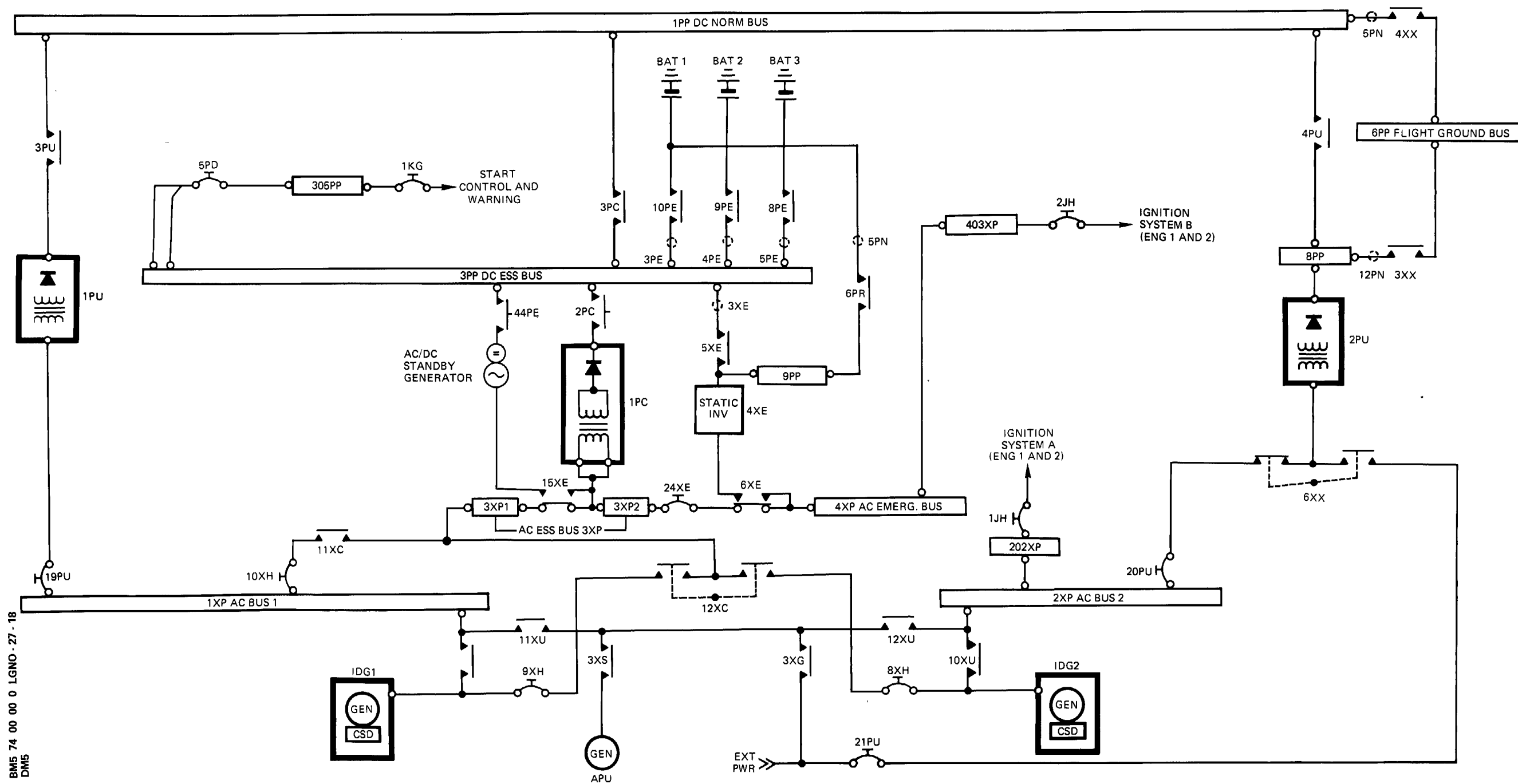
Component Location - Indicators and Controls  
Figure 001

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Ignition System - Electrical Supply  
Figure 002

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**1. Operational Test**

**A. Reason for the Job**

Audible check of the ignition system to check for correct operation.

**NOTE** : Properly operating igniters give 1 to 5 sharp cracking sounds per second. The ignition system check indicates circuit continuity and operation but does not assure spark energy is adequate for ignition.

**B. Equipment and Materials**

| ITEM                     | DESIGNATION               |
|--------------------------|---------------------------|
| Referenced Procedures    |                           |
| - 24-41-00, P. Block 301 | AC External Power Control |
| - 28-21-00, P. Block 1   | Fuel Pump System          |
| - 71-00-00, P. Block 501 | Power Plant               |
| - 71-13-00, P. Block 301 | Cowl Doors                |

**C. Procedure**

**WARNING** : MAKE CERTAIN THAT FUEL PUMPS ARE INOPERATIVE (REF. 28-21-00, P. BLOCK 1).

BEFORE POWER IS SUPPLIED TO THE AIRCRAFT MAKE CERTAIN THAT ELECTRICAL CIRCUITS UPON WHICH WORK IS IN PROGRESS ARE ISOLATED. MAKE CERTAIN THAT NO BLEED AIR IS CONNECTED TO GROUND CART AND APU BLEED AIR SWITCH IS IN OFF POSITION.

**CAUTION** : PRIOR TO AUDIBLE CHECK, MOTOR ENGINE IF UNBURNED FUEL IN ENGINE IS SUSPECTED. UNBURNED FUEL COULD RESULT IN AN INTERNAL ENGINE FIRE OR TAILPIPE FIRE.

**(1) Job set-up**

(a) Energize the aircraft electrical network (Ref. 24-41-00, P. Block 301).

(b) Make certain that electronics racks ventilation is correct.

(c) Open, safety and tag the appropriate circuit breakers, except 1KG, 1JH, 2JH, 3KC, 4KC.

(d) Perform dry motoring (Ref. 71-00-00, P. Block 501).

(e) Open cowl doors (Ref. 71-13-00, P. Block 301).

**(2) Test of the START A and START B systems :**

| ACTION                                                               | RESULT                                                                                             |
|----------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|
| <b>1. On ENG START panel 429VU</b>                                   |                                                                                                    |
| - place ENG START selector switch in START B position                | - ARM legends of START 1 and START 2 pushbutton switches come on                                   |
| - press START 1 and START 2 pushbutton switches                      | - ARM legends go off                                                                               |
| <b>2. On panel 9VU</b>                                               |                                                                                                    |
| - place HP fuel shut off valve control levers 1 and 2 in ON position | - on engines 1 and 2, plugs B produce normal sounds, proving that igniter plugs operate correctly. |

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| ACTION                                                                                                                                                                                                                       | RESULT                                                                                                                                                                                                                |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>- place HP fuel shut off valve control levers 1 and 2 in OFF position</li> </ul>                                                                                                      | <ul style="list-style-type: none"> <li>- on engines 1 and 2 igniter plugs B are cut off.</li> </ul>                                                                                                                   |
| <b>3. On panel 429VU</b> <ul style="list-style-type: none"> <li>- place ENG START selector switch in START (A) position</li> <li>- press START 1 and START 2 pushbutton switches</li> </ul>                                  | <ul style="list-style-type: none"> <li>- ARM legends of START 1 and START 2 pushbutton switches come on</li> <li>- ARM legends go off.</li> </ul>                                                                     |
| <b>4. On panel 9VU</b> <ul style="list-style-type: none"> <li>- place HP fuel shut off valve control levers 1 and 2 in ON position</li> <li>- place HP fuel shut off valve control levers 1 and 2 in OFF position</li> </ul> | <ul style="list-style-type: none"> <li>- on engines 1 and 2, igniter plugs A produce normal sounds proving that igniter plugs operate correctly</li> <li>- on engines 1 and 2, igniter plugs A are cut off</li> </ul> |

**(3)Test of the CONT RELIGHT system**

| ACTION                                                                                                                                                                                                                       | RESULT                                                                                                                                                                                                               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>1. On panel 429VU</b> <ul style="list-style-type: none"> <li>- place ENG START selector switch in CONT RELIGHT position</li> </ul>                                                                                        | <ul style="list-style-type: none"> <li>- ARM legends of START 1 and START 2 pushbutton switches come on</li> </ul>                                                                                                   |
| <b>2. On panel 133VU</b> <ul style="list-style-type: none"> <li>- open IGNITION SYS A 334/S72 circuit breaker 1JH</li> </ul>                                                                                                 |                                                                                                                                                                                                                      |
| <b>3. On panel 9VU</b> <ul style="list-style-type: none"> <li>- place HP fuel shut off valve control levers 1 and 2 in ON position</li> <li>- place HP fuel shut off valve control levers 1 and 2 in OFF position</li> </ul> | <ul style="list-style-type: none"> <li>- on engines 1 and 2, igniter plugs B produce normal sounds proving that igniter plugs operate correctly</li> <li>- on engines 1 and 2 igniter plugs B are cut off</li> </ul> |
| <b>4. On panel 133VU</b> <ul style="list-style-type: none"> <li>- close circuit breaker 1JH and open IGNITION SYS B 333/T72 circuit breaker 2JH</li> </ul>                                                                   |                                                                                                                                                                                                                      |
| <b>5. On panel 9VU</b> <ul style="list-style-type: none"> <li>- place HP fuel shut off valve control levers 1 and 2 in ON position</li> <li>- place HP fuel shut off valve control levers 1 and 2 in OFF position</li> </ul> | <ul style="list-style-type: none"> <li>- on engines 1 and 2 igniter plugs A produce normal sounds proving that igniter plugs operate correctly</li> <li>- on engines 1 and 2, igniter plugs A are cut off</li> </ul> |

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| ACTION                                                        | RESULT               |
|---------------------------------------------------------------|----------------------|
| trol levers 1 and 2 in OFF position                           | are cut off          |
| 6. On panel 133VU                                             |                      |
| - close circuit breaker 2JH                                   |                      |
| 7. On panel 429VU                                             |                      |
| - place ENG START selector switch in OFF position             | - ARM legends go off |
| (4)Close-up                                                   |                      |
| (a)De-energize the aircraft electrical network.               |                      |
| (b)Restore system and aircraft to normal operating condition. |                      |
| (c)Close cowl doors (Ref. 71-13-00, P. Block 301).            |                      |
| (d)Remove safety clips and tags and close circuit breakers.   |                      |

**AIRCRAFT MAINTENANCE MANUAL****ELECTRICAL POWER SUPPLY/DESCRIPTION AND OPERATION****1. Description**

(Ref. Fig. 001)

(Ref. Fig. 002)

The ignition exciters transform the 115 V - 400 Hz current into high voltage pulsating current. This current then charges internal capacitors ; the stored energy is approximately 15 joules. The discharge rate is two per second, and the delivered energy is two joules.

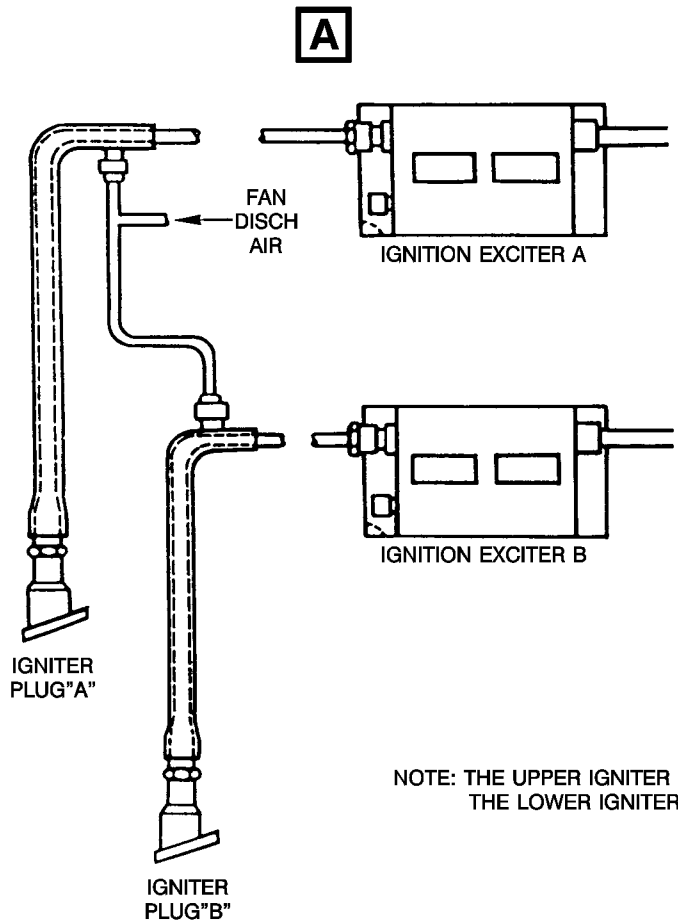
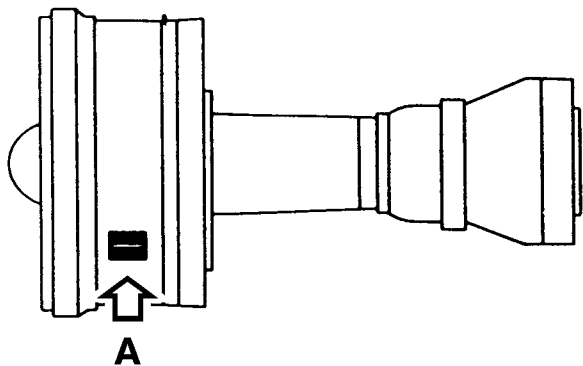
Each engine has two independent ignition exciters A and B. Ignition exciter A supplies the lower igniter plug while ignition exciter B supplies the upper igniter plug. The two exciters may be operated independently or simultaneously, nevertheless, alternating operation of the exciters is recommended to avoid premature wear of igniter plugs.

The ignition exciters are mounted on an intermediate bracket to the fan casing, engine LH side. Each ignition exciter is a rectangular box which has three connectors for power input, spark output and condition monitoring signal.

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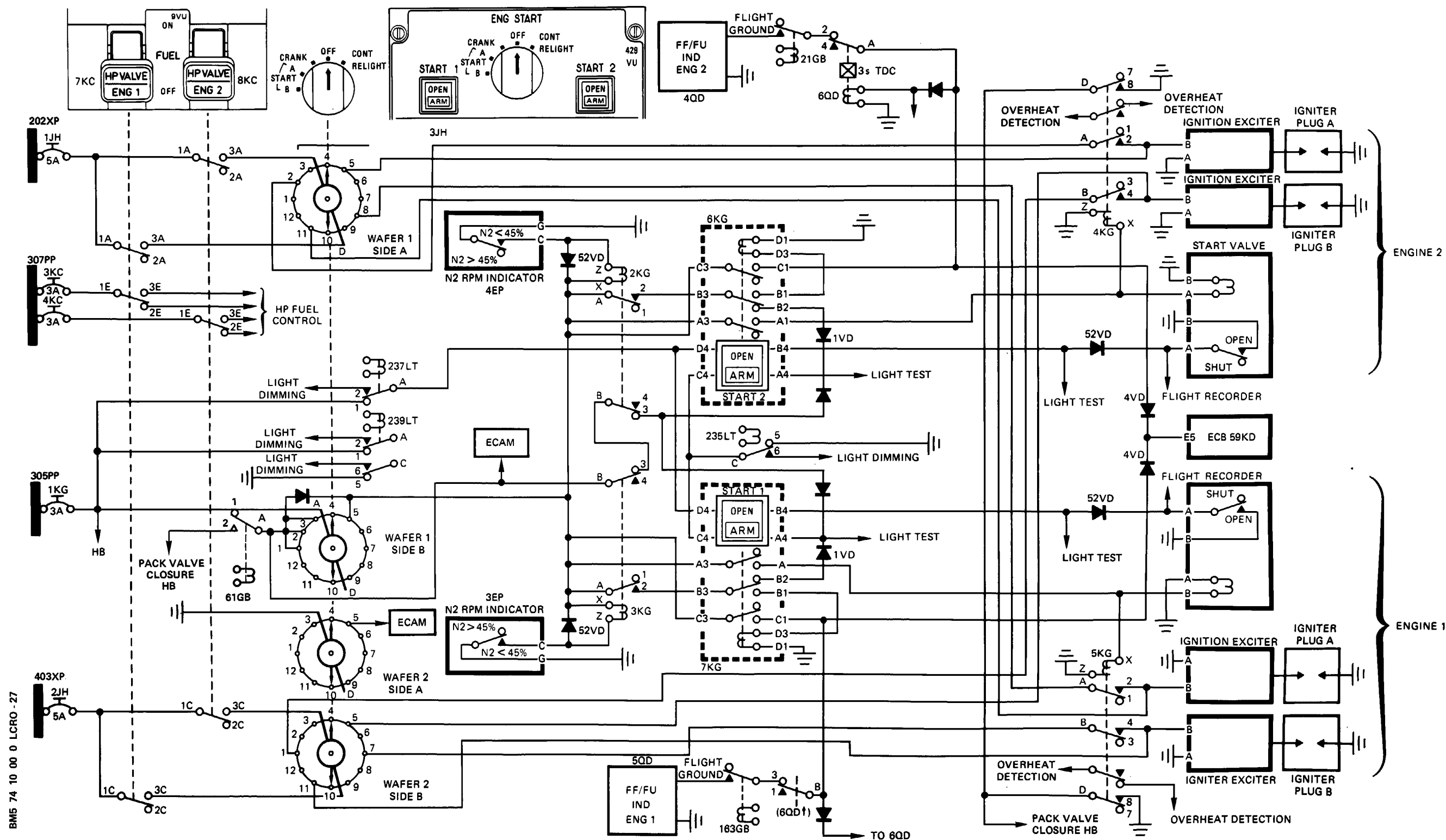
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Ignition System - Schematic  
Figure 002

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**AIRCRAFT MAINTENANCE MANUAL**

**IGNITION EXCITERS - REMOVAL/INSTALLATION**

**1. General**

**WARNING** : IGNITION VOLTAGE IS DANGEROUSLY HIGH AND CAN CAUSE SERIOUS INJURY OR DEATH. DO NOT OPERATE THE IGNITION SYSTEM FOR FIVE MINUTES BEFORE YOU REMOVE THE IGNITION COMPONENTS. MAKE SURE YOU GROUND THE EXCITER OUTPUT TERMINAL AFTER YOU DISCONNECT THE IGNITER PLUG CABLE.

A. The following procedures are to be used when removing or installing the ignition exciters. Access to the ignition exciters is gained by opening the left fan cowl.

**2. Equipment and Materials**

| ITEM                     | DESIGNATION                                            |
|--------------------------|--------------------------------------------------------|
| A.                       | Circuit Breaker Safety Clips                           |
| B.                       | Torque Wrench 55 - 150 lbf. in.<br>(0.62 - 1.70 m.daN) |
| Referenced Procedures    |                                                        |
| - 71-13-00, P. Block 301 | Cowl Doors                                             |
| - 74-00-00, P. Block 501 | Ignition General                                       |

**3. Procedure**

**A. Job Set-Up**

(1)Open, safety and tag the appropriate circuit breakers and open fan cowl doors (Ref. 71-13-00, P. Block 301).

Pre SB GE 72-117 \*\*\* (IGNITION EXCITER MOUNTING WITHOUT SHOULDERED STUD)

**B. Removal of Ignition Exciter (Ref. Fig. 401)**

**WARNING** : IGNITION VOLTAGE IS DANGEROUSLY HIGH AND CAN CAUSE SERIOUS INJURY OR DEATH. DO NOT OPERATE THE IGNITION SYSTEM FOR FIVE MINUTES BEFORE YOU REMOVE THE IGNITION COMPONENTS. MAKE SURE YOU GROUND THE EXCITER OUTPUT TERMINAL AFTER YOU DISCONNECT THE IGNITER PLUG CABLE.

**CAUTION** : IGNITION CABLE CONNECTORS ARE TO BE ENGAGED AND DISENGAGED USING STRAIGHT AXIAL PUSH OR PULL FORCES ONLY. NO WIGGLING OR SIDE-TO-SIDE FLEXING OF THE CABLE IS PERMITTED.

(1)Disconnect the input and output leads from the exciter. Cap or plug all the openings.

(2)Remove 4 bolts and washers securing ignition exciter to shock mount bracket.

**NOTE** : When removing the upper ignition exciter box, the ground lead will be disconnected when the upper forward mounting bolt is removed.

(3)Cap electrical connectors on exciter box.

**C. Installation of Ignition Exciter. (Ref. Fig. 401)**

(1)Install exciter on shock mounts and secure with 4 bolts and washers. TORQUE to between 55 and 70 lbf.in. (0.62 and 0.79 m.daN).

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**NOTE** : When installing the upper ignition exciter box, secure ground lead with the upper, forward mounting bolt and washer

(2) Remove caps and plugs from igniter leads and exciter connections.

**CAUTION** : IGNITION CABLE CONNECTORS ARE TO BE ENGAGED AND DISENGAGED USING STRAIGHT AXIAL PUSH OR PULL FORCES ONLY. NO WIGGLING OR SIDE-TO-SIDE FLEXING OF THE CABLE IS PERMITTED.

R (3) Connect output ignition lead to exciter. TORQUE output lead to between 140 and 160 lbf.in. (1.58 and 1.80 m.daN).

R (4) Connect input lead to exciter. TORQUE input lead to between 140 and 160 lbf.in. (1.58 and 1.80 m.daN).

**NOTE** : Connect leads so that upper exciter operates lower igniter plug.

END Pre SB GE 72-117

SB GE 72-117 \*\*\* (IGNITION EXCITER MOUNTING WITH SHOULDERED STUD)

**B. Removal of Ignition Exciter (Ref. Fig. 402)**

**CAUTION** : IGNITION CABLE CONNECTORS ARE TO BE ENGAGED AND DISENGAGED USING STRAIGHT AXIAL PUSH OR PULL FORCES ONLY. NO WIGGLING OR SIDE - TO - SIDE FLEXING OF THE CABLE IS PERMITTED.

**WARNING** : IGNITION VOLTAGE IS DANGEROUSLY HIGH AND CAN CAUSE SERIOUS INJURY OR DEATH. DO NOT OPERATE THE IGNITION SYSTEM FOR FIVE MINUTES BEFORE YOU REMOVE THE IGNITION COMPONENTS. MAKE SURE YOU GROUND THE EXCITER OUTPUT TERMINAL AFTER YOU DISCONNECT THE IGNITER PLUG CABLE.

(1) Disconnect the input and output leads from the exciter. Cap or plug all the openings.

(2) Remove 3 bolts and washers securing ignition exciter to shock mount bracket.

(3) Remove shouldered stud securing grounding strap and exciter to shock mount bracket.

**NOTE** : Shouldered stud and grounding strap are located on the upper forward mounting hole.

**C. Installation of Ignition Exciter**

(1) Install exciter on shock mounts and secure with 3 bolts and washers. TORQUE to between 55 and 70 lbf.in. (0.62 and 0.79 m.daN).

(2) Install grounding strap on shouldered stud and secure to exciter and shock mount. TORQUE to between 55 and 70 lbf. in. (0.62 and 0.79 m.daN).

**NOTE** : Shouldered stud and grounding strap are located on the upper forward mounting hole.

R (3) Connect output ignition lead to exciter. TORQUE output lead to between 140 and 160 lbf.in. (1.58 and 1.80 m.daN).

R (4) Connect input ignition lead to exciter. TORQUE to between 140 and 160 lbf.in. (1.58 and 1.80 m.daN).

END SB GE 72-117

**D. Removal of Shock Mount.**

(1) Remove both exciters per paragraph 3.A.

(2) Remove 4 bolts securing shock mount to brackets and remove shock mount.

**E. Installation of Shock Mount.**

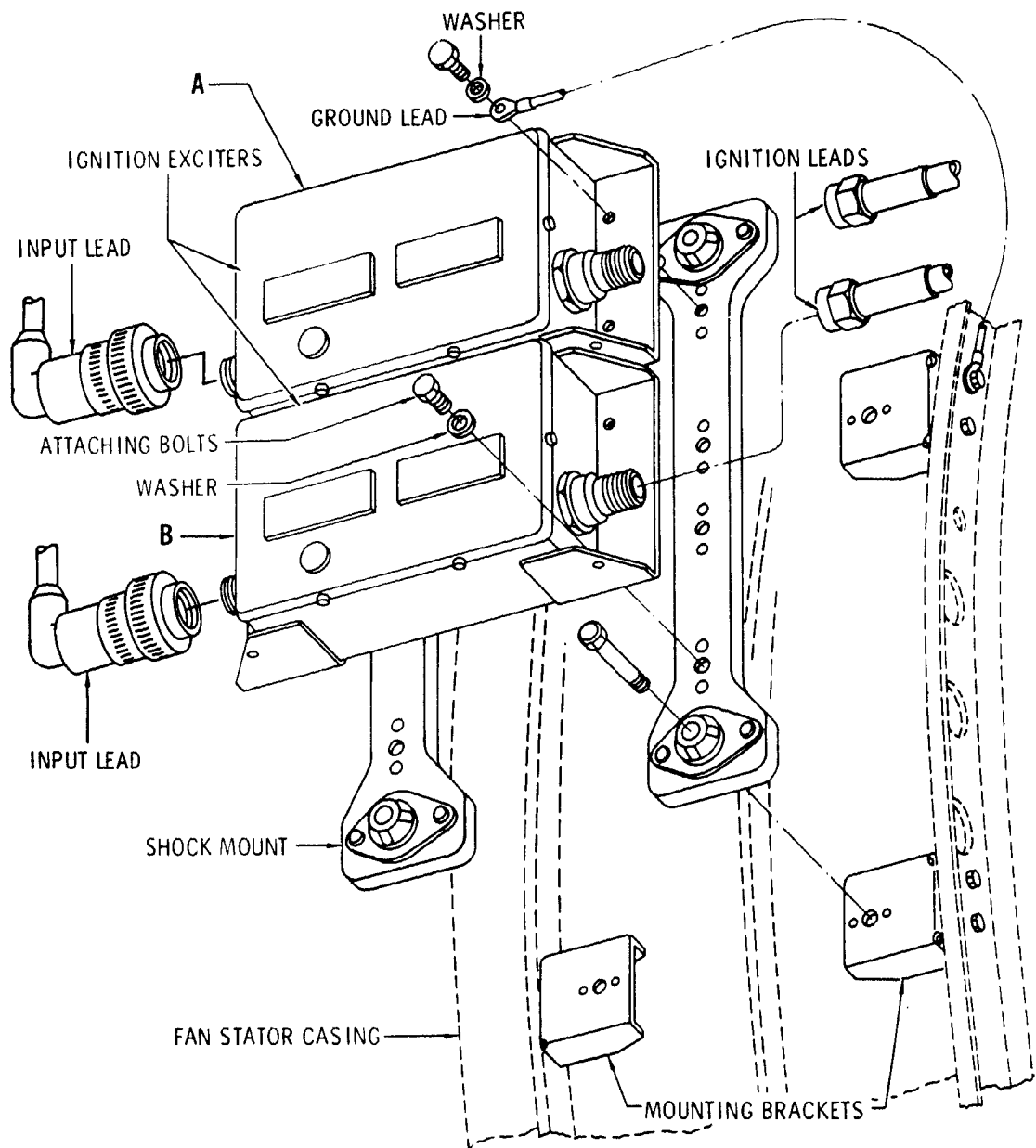
(1) Position shock mount on brackets and secure with bolts. TORQUE to between

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Ignition Exciters Installation (Without Shouldered Stud)  
Figure 401

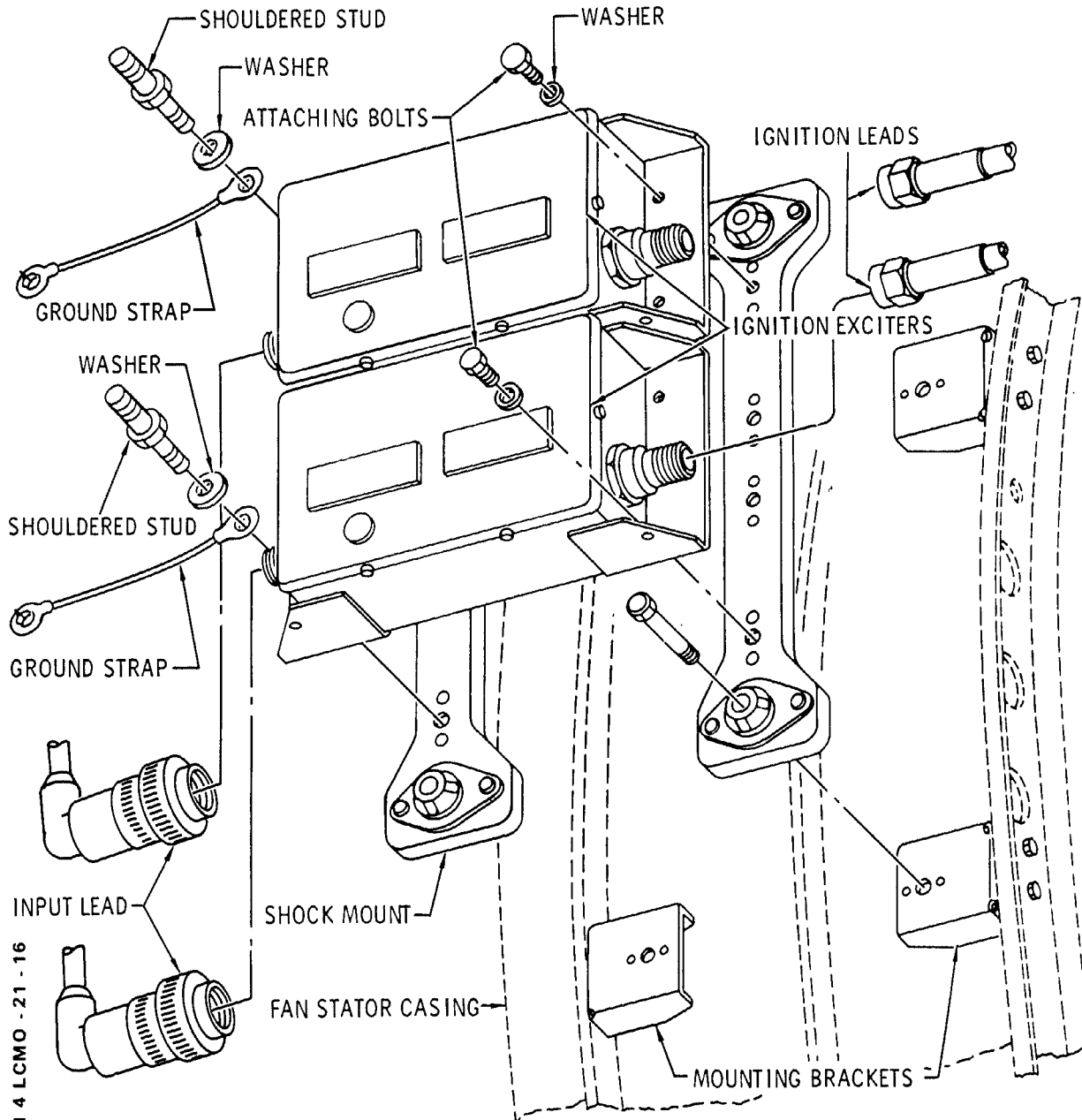
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Ignition Exciters Installation (With Shouldered Stud)  
Figure 402

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55 and 70 lbf.in. (0.62 and 0.79 m.daN).  
(2) Install both exciters per paragraph 3.B.

**F. Test and Close-Up**

- (1) Carry out test of ignition system (Ref. 74-00-00, P. Block 501).
- (2) Make certain that working area is clean and clear of tools and miscellaneous items of equipment.
- (3) Close fan cowl door (Ref. 71-13-00, P. Block 301).
- (4) Remove safety clips and tags and close circuit breakers.

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# AIRCRAFT MAINTENANCE MANUAL

## IGNITION EXCITERS - INSPECTION/CHECK

### 1. General

**WARNING :** IGNITION VOLTAGE IS DANGEROUSLY HIGH AND CAN CAUSE SERIOUS INJURY OR DEATH. DO NOT OPERATE THE IGNITION SYSTEM FOR FIVE MINUTES BEFORE YOU REMOVE THE IGNITION COMPONENTS. MAKE SURE YOU GROUND THE EXCITER OUTPUT TERMINAL AFTER YOU DISCONNECT THE IGNITER PLUG CABLE.

A. The following procedures provide instructions for inspection of ignition exciters.

### 2. Equipment and Materials

| ITEM                     | DESIGNATION                  |
|--------------------------|------------------------------|
| A.                       | Circuit Breaker Safety Clips |
| Referenced Procedures    |                              |
| - 71-13-00, P. Block 301 | Cowl Doors                   |
| - 74-11-01, P. Block 401 | Ignition Exciters            |

### 3. Procedure

#### A. Job Set-Up

- (1)Open, safety and tag the appropriate circuit breakers and open fan cowl door (Ref. 71-13-00, P. Block 301).
- (2)Remove ignition exciters (Ref. 74-11-01, P. Block 401).

#### B. Inspect the following

| INSPECT/CHECK                  | MAXIMUM SERVICEABLE LIMITS                                                      | REMARKS                                                                   |
|--------------------------------|---------------------------------------------------------------------------------|---------------------------------------------------------------------------|
| (1)All Areas for :             |                                                                                 |                                                                           |
| (a)Cracks                      | Not serviceable                                                                 | Replace exciter                                                           |
| (b)Nicks, dents or scratches   | Any number, 0.030 inch (0.76 mm) deep                                           | Replace exciter                                                           |
| (2)Electrical Connectors for : |                                                                                 |                                                                           |
| (a)Thread damage               | 30 percent on one entrance or 10 percent damage on each of two entrance threads | Chase thread if within limits or replace exciter                          |
| (b)Pin damage                  | Must mate freely with respective leads                                          | Replace exciter                                                           |
| (c)Ceramic insulator damage    | Not serviceable                                                                 | Replace exciter if ceramic is nicked or cracked or is electrically eroded |

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**C. Close-Up**

- (1) Install ignition exciters (Ref. 74-11-01, P. Block 401).
- (2) Make certain that working area is clean and clear of tools and miscellaneous items of equipment.
- (3) Remove safety clips and tags and close circuit breakers. Close fan cowl door (Ref. 71-13-00, P. Block 301).

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**AIRCRAFT MAINTENANCE MANUAL**

**IGNITION EXCITERS - CLEANING/PAINTING**

**1. General**

**WARNING** : IGNITION VOLTAGE IS DANGEROUSLY HIGH AND CAN CAUSE SERIOUS INJURY OR DEATH. DO NOT OPERATE THE IGNITION SYSTEM FOR FIVE MINUTES BEFORE YOU REMOVE THE IGNITION COMPONENTS. MAKE SURE YOU GROUND THE EXCITER OUTPUT TERMINAL AFTER YOU DISCONNECT THE IGNITER PLUG CABLE.

A. The following procedures are to be used when cleaning the ignition exciter.

**2. Equipment and Materials**

| ITEM                     | DESIGNATION                  |
|--------------------------|------------------------------|
| A.                       | Circuit Breaker Safety Clips |
| B.                       | Wood Alcohol                 |
| Referenced Procedures    |                              |
| - 71-13-00, P. Block 301 | Cowl Door                    |
| - 74-11-01, P. Block 401 | Ignition Exciters            |

**3. Procedure**

**A. Job Set-Up**

- (1)Open, safety and tag the appropriate circuit breakers and open fan cowl door (Ref. 71-13-00, P. Block 301).
- (2)Remove ignition exciters (Ref. 74-11-01, P. Block 401).

**B. Cleaning**

**WARNING** : PERFORM THIS OPERATION IN AN APPROVED CLEANING CABINET OR WELL VENTILATED AREA. TAKE PRECAUTIONS TO PREVENT INHALATION OF VAPORS AND TO MINIMIZE FIRE HAZARDS. REPEATED OR PROLONGED CONTACT OF THIS CLEANING MATERIAL WITH THE SKIN WILL REMOVE SKIN OILS AND MAY CAUSE SEVERE DERMATITIS.

- (1)Clean dirty connector wells with a soft bristle brush soaked in wood alcohol.
- (2)Blow dry with clean shop air.

**C. Close-Up**

- (1)Install ignition exciters (Ref. 74-11-01, P. Block 401).
- (2)Remove safety clips and tags and close circuit breakers close fan cowl door (Ref. 71-13-00, P. Block 301).

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## AIRCRAFT MAINTENANCE MANUAL

### DISTRIBUTION - DESCRIPTION AND OPERATION

#### 1. General (Ref. Fig. 001)

The ignition for each engine is carried out by means of one or both ignition exciters which transforms aircraft 115 V - 400 Hz power supply into high voltage pulsating current.

The high voltage flows through the ignition lead (shielded and ventilated) and delivers to the igniter plug the power required to initiate the fuel/air mixture combustion by a series of sparks.

Pre GE SB74-002\*\*\* (NON-IMPROVED IGNITION LEADS, IGNITER PLUGS AND IGNITION SYSTEM HARDWARE).

#### 2. Description

##### (a) Ignition leads

The two ignition leads are identical. They transmit the power supplied by the ignition exciter to the corresponding igniter plug.

The aft section of each lead includes a larger diameter ventilated conduit in which flows the air bled from the fan area thus ensuring cable cooling. Each cable end is fitted with a connector enabling connection either to the ignition exciters or igniter plug.

##### (b) Igniter plugs (Ref. Fig. 002)

Each cable supplies an igniter plug installed at approximately 3 and 4 o'clock at combustion chamber level and adjacent to a fuel nozzle. The igniter plug has a center Hastelloy X electrode separated from the external electrode by a ceramic shell.

The plug is held in place on the engine case by means of an adapter.

#### 3. Operation

The electrical potential developed by the ignition exciter capacitor discharge is sent through the lead to the igniter plug center electrode. When the potential difference between the igniter plug center electrode and external electrode is high enough, the air becomes ionized and the spark occurs, thus initiating the fuel/air mixture combustion in the combustion chamber.

End Pre GE SB74-002

GE SB74-002 XXX (IMPROVED IGNITION LEADS, IGNITER PLUGS, AND IGNITION SYSTEM HARDWARE).

#### 4. Description

##### A. Ignition Leads

The new ignition system consists of a single-piece lead design featuring a type 3 exciter connector plus a new aft (igniter) terminal featuring an ARP 670 type 4M connector. The igniter is a threaded type 4F design. This connection features a silicone seal utilized to prevent electrical flash-over in the igniter well. A convective cooling shroud is also included to more efficiently utilize the lead discharge air.

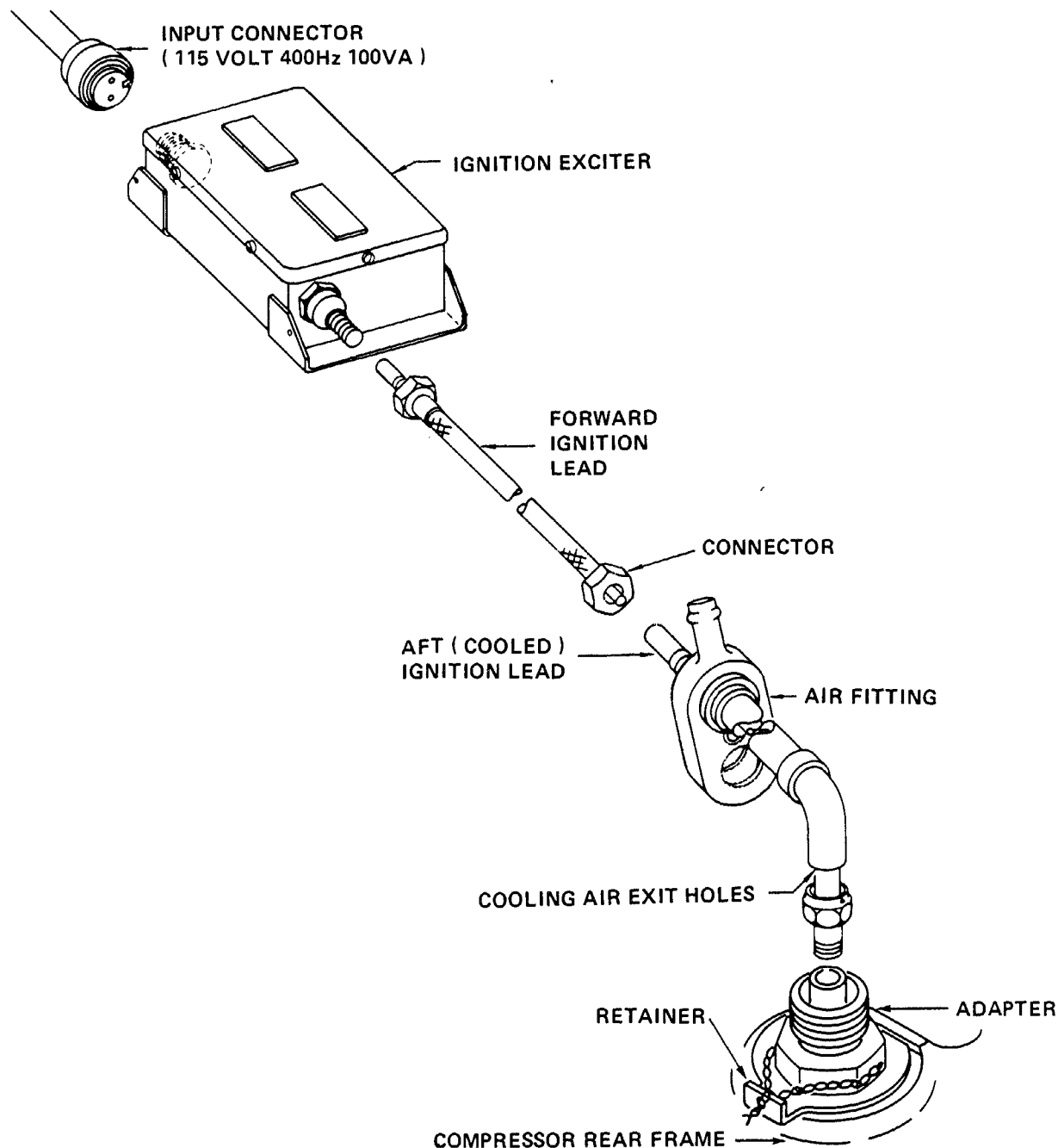
This is to ensure that the seal in the igniter terminal remains below 450°F (230°C). In addition, to improve the cooling characteristics, the conduit size of the aft portion of the lead has been increased to provide additional airflow passage. This new lead also features the following impro-

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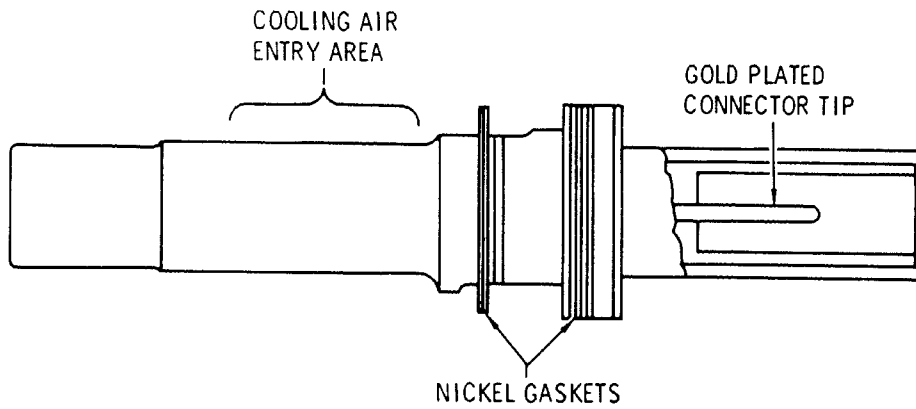
Ignition System  
Figure 001

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Ignitor Plug  
 Figure 002

BMS 74 20 00 0 LCMO - 13 - 07  
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**AIRCRAFT MAINTENANCE MANUAL**

vements in conduit construction and conduit termination.

- (1) Teflon liner added between convoluted (metal) conduit and inner braid to reduce abrasive effects experienced on present leads between braid and conduit.
- (2) Teflon five-spline spacer in air-cooled section to center the insulated cable for more uniform cooling as well as minimized abrasion between center wire and inner braid.
- (3) Strain-relief fittings at each conduit brazed termination. Service experience with present hardware indicates that conduit cracking and leaking are associated with mechanical flexure of braze joints ; the proposed strain reliefs restrict such flexure and will improve conduit life.

**B. Igniter Plugs (Ref. Fig. 003)**

The type 4 igniter plug is threaded into an adapter plug, which is threaded into the compressor rear frame. The immersion depth is determined by the number of spacer gaskets installed under the adapter plug. When the Type 4 igniter plug is removed, the igniter plug may be replaced or reinstalled without installing any spacer gaskets. The immersion depth of the igniter plug remains the same as long as the adapter plug and spacer gaskets were not removed.

When charged by a high voltage from the ignition exciter, the igniter provides an arc to ignite the fuel being injected into the combustor by the fuel flow divider valve and injector assemblies.

**5. Operation**

When the ignition exciter discharges the high voltage pulses through the ignition leads to the igniter, electric arc pulses occur between the electrode tip and ground washer, and an ionized discharge occurs from the hole in the shell into the combustor. The hot ion discharge ignites the fuel injected by the fuel flow divider valve and injector assemblies. The electrical pulse discharges continue until electrical supply to the ignition exciter is discontinued.

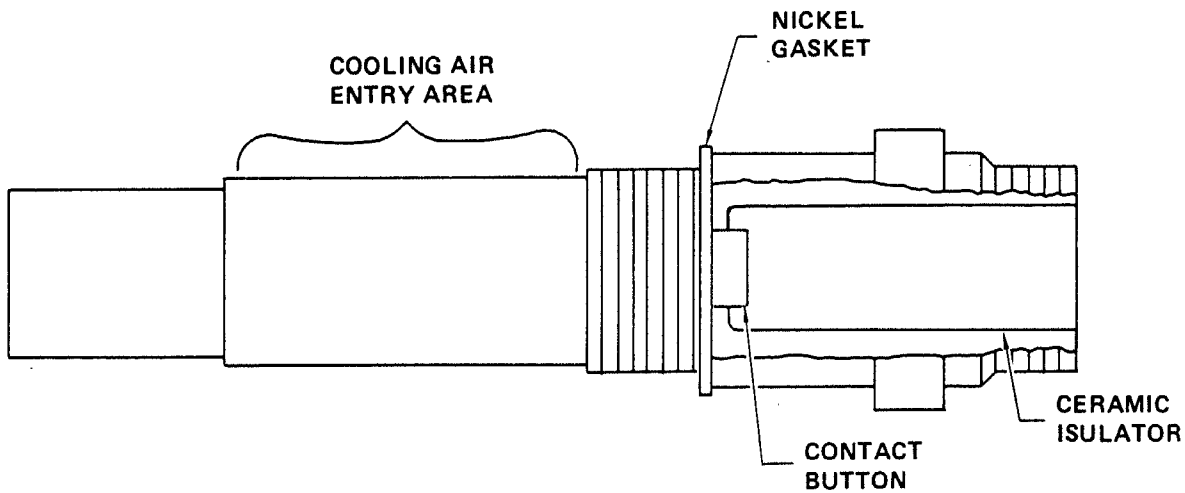
End GE SB74 002

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Igniter Plug (Type 4)  
Figure 003

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**AIRCRAFT MAINTENANCE MANUAL**

**IGNITION LEADS - REMOVAL/INSTALLATION**

**1. General**

This procedure pertains to the removal and installation of the Ignition Leads. The leads run from the ignition exciters located on the fan case at the 7 o'clock position (aft looking forward) to the igniter plugs on the compressor frame at the 3 and 4 o'clock positions.

**NOTE :** The upper ignition exciter is connected to the lower igniter plug, and the lower ignition exciter is connected to the upper igniter plug.

**2. Equipment and Materials**

| ITEM                     | DESIGNATION                                    |
|--------------------------|------------------------------------------------|
| A.                       | Access Platform                                |
| B.                       | Circuit Breaker Safety Clips                   |
| C.                       | Torque Wrench 24-348 lbf.in. (0.27-3.93 m.daN) |
| D.                       | Corrosion Resistant Steel Lockwire             |
| E.                       | Caps                                           |
| F.                       | Plugs                                          |
| Referenced Procedures    |                                                |
| - 71-13-00, P. Block 301 | Cowl Doors                                     |
| - 74-00-00, P. Block 501 | Ignition - General                             |

Pre GE SB 74-002 \*\*\* (NON IMPROVED IGNITION LEADS, IGNITER PLUGS AND IGNITION SYSTEM HARDWARE)

**3. Procedure**

**A. Job Set-Up**

- (1) Open safety and tag the appropriate circuit breakers and open cowl doors (Ref. 71-13-00, P. Block 301).
- (2) Install access platform.

**B. Removal (Ref. Fig. 401)**

**WARNING :** IGNITION VOLTAGE IS DANGEROUSLY HIGH AND CAN CAUSE SERIOUS INJURY OR DEATH. DO NOT OPERATE THE IGNITION SYSTEM FOR FIVE MINUTES BEFORE YOU REMOVE THE IGNITION COMPONENTS. MAKE SURE YOU GROUND THE EXCITER OUTPUT TERMINAL AFTER YOU DISCONNECT THE IGNITER PLUG CABLE.

**CAUTION :** THE IGNITION LEAD HOLDS THE IGNITER PLUG IN AN ADAPTER. DO NOT ALLOW PLUG TO DROP WHEN LEAD IS REMOVED.

**CAUTION :** WHEN REMOVING, INSTALLING, OR HANDLING THE IGNITION LEADS, USE CARE TO PREVENT BENDING OF THE AIR-COOLING SHROUD. SHARP BENDS CAN CAUSE HOT GAS TO FLOW OVER THE INSULATION RESULTING IN EVENTUAL HIGH VOLTAGE BREAKDOWN.

- (1) Remove the forward ignition leads as follows :

- (a) Remove retainer securing forward leads to the oil tank forward outlet tube by removing bolt.

**CAUTION :** IGNITION CABLE CONNECTORS ARE TO BE ENGAGED AND DISENGAGED

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## AIRCRAFT MAINTENANCE MANUAL

USING STRAIGHT AXIAL PUSH OR PULL FORCES ONLY. NO WIGGLING OR SIDE-TO-SIDE FLEXING OF THE CABLE IS PERMITTED.

- (b) Disconnect lead from ignition exciter.
  - (c) Detach air fitting from bracket by removing bolt and nut.
  - (d) Disconnect forward lead from aft lead at the air fitting.
  - (e) Unlock hinged loop clamps securing lead to engine by turning bolt 1/4-turn CCW.
  - (f) Remove lead and install protective caps and plugs.
  - (g) Remove slotted grommets and retain for installation on new lead if serviceable.
- (2) Remove aft ignition lead as follows :
- (a) Detach air fitting from bracket by removing bolt and nut.
  - (b) Disconnect aft lead from forward lead at the air fitting.
  - (c) Unlock hinged loop clamps securing lead to engine by turning bolt 1/4-turn CCW.
  - (d) Remove lockwire and disconnect lead from igniter plug.
  - (e) Remove the seal from the ignition lead and discard the seal (Type 4 ignition system).
  - (f) Remove lead and install protective caps and plugs.
  - (g) Remove slotted grommets and retain for installation on new lead if serviceable.

### C. Installation of the Ignition Leads (Ref. Fig. 401)

- (1) Install forward ignition lead as follows :

**NOTE** : To prevent forward ignition lead from chafing against adjacent parts, add chafing shield and silicone tape as required.

- (a) Install serviceable slotted grommets on new ignition lead.

**CAUTION** : IGNITION CABLE CONNECTORS ARE TO BE ENGAGED AND DISENGAGED USING STRAIGHT AXIAL PUSH OR PULL FORCES ONLY. NO WIGGLING OR SIDE-TO-SIDE FLEXING OF THE CABLE IS PERMITTED.

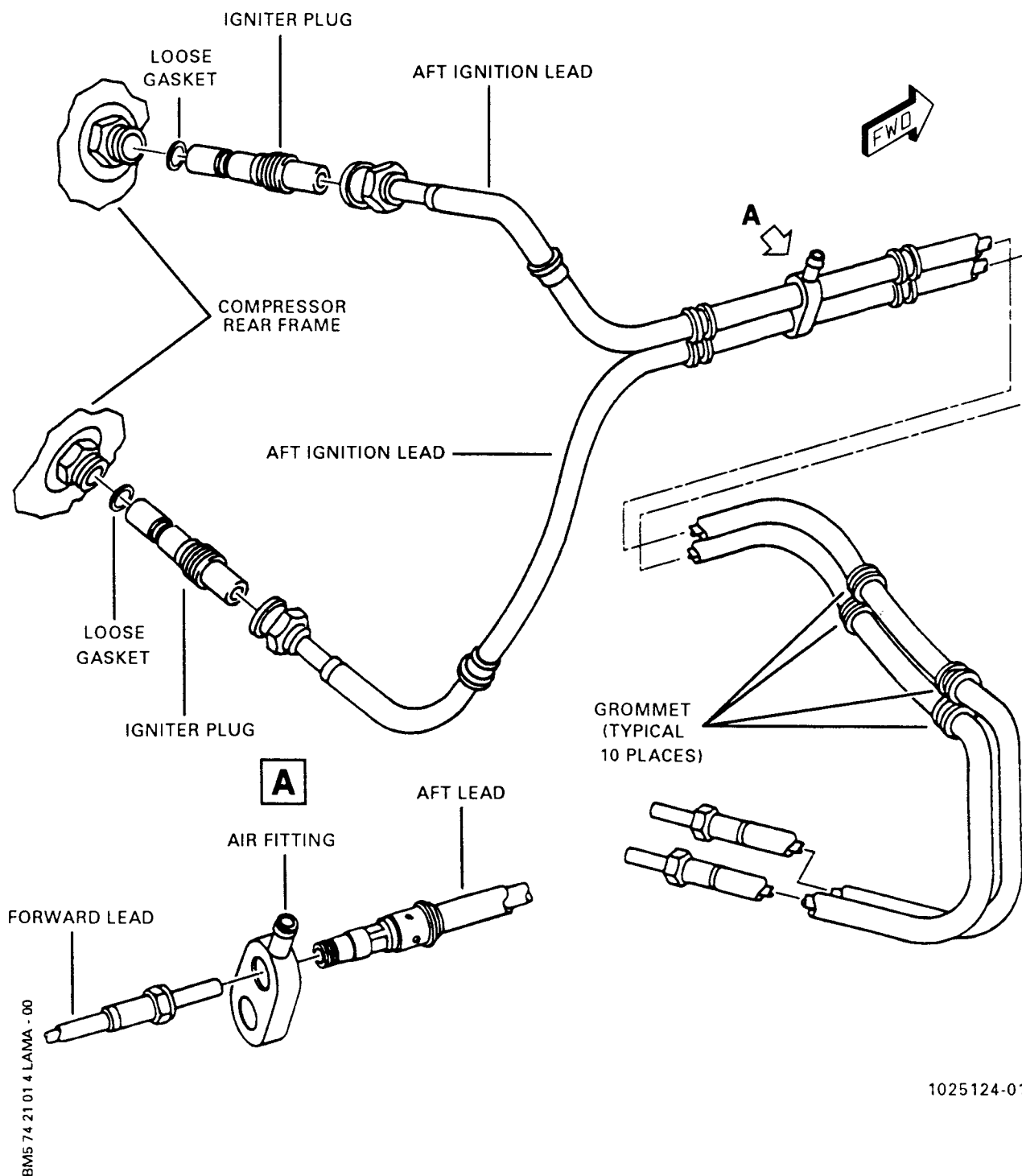
- (b) Route lead into position and install into hinged loop clamps. Make sure slotted grommet is between lead and clamp.
  - (c) Connect forward lead to aft lead at the air fitting. TORQUE nut to between 140 and 160 lbf.in. (1.58 and 1.80 m.daN).
  - (d) Secure air fitting to bracket with bolt and nut. TORQUE nut to between 55 and 70 lbf.in. (0.62 and 0.79 m.daN).
  - (e) Connect lead to ignition exciter. TORQUE nut to between 140 and 160 lbf.in. (1.58 and 1.80 m.daN).
  - (f) Secure leads to the oil tank forward outlet tube with retainer and bolt. TORQUE nut to between 33 and 37 lbf.in. (0.37 and 0.42 m.daN).
  - (g) Lock hinged loop clamps by turning bolt 1/4-turn CW.
- (2) Install aft ignition leads as follows :
- (a) Install serviceable slotted grommets on new ignition lead.
  - (b) Route lead into position and install into hinged loop clamps. Make sure slotted grommet is between lead and clamp.
  - (c) Connect aft lead to forward lead at the air fitting. TORQUE nut to between 140 and 160 lbf.in. (1.58 and 1.80 m.daN).
  - (d) Secure air fitting to bracket with bolt and nut. TORQUE nut to between 55 and 70 lbf.in. (0.62 and 0.79 m.daN).
- NOTE** : There are two different types of silicone seal (chamfered and symmetric). You must make sure the correct seal is installed.

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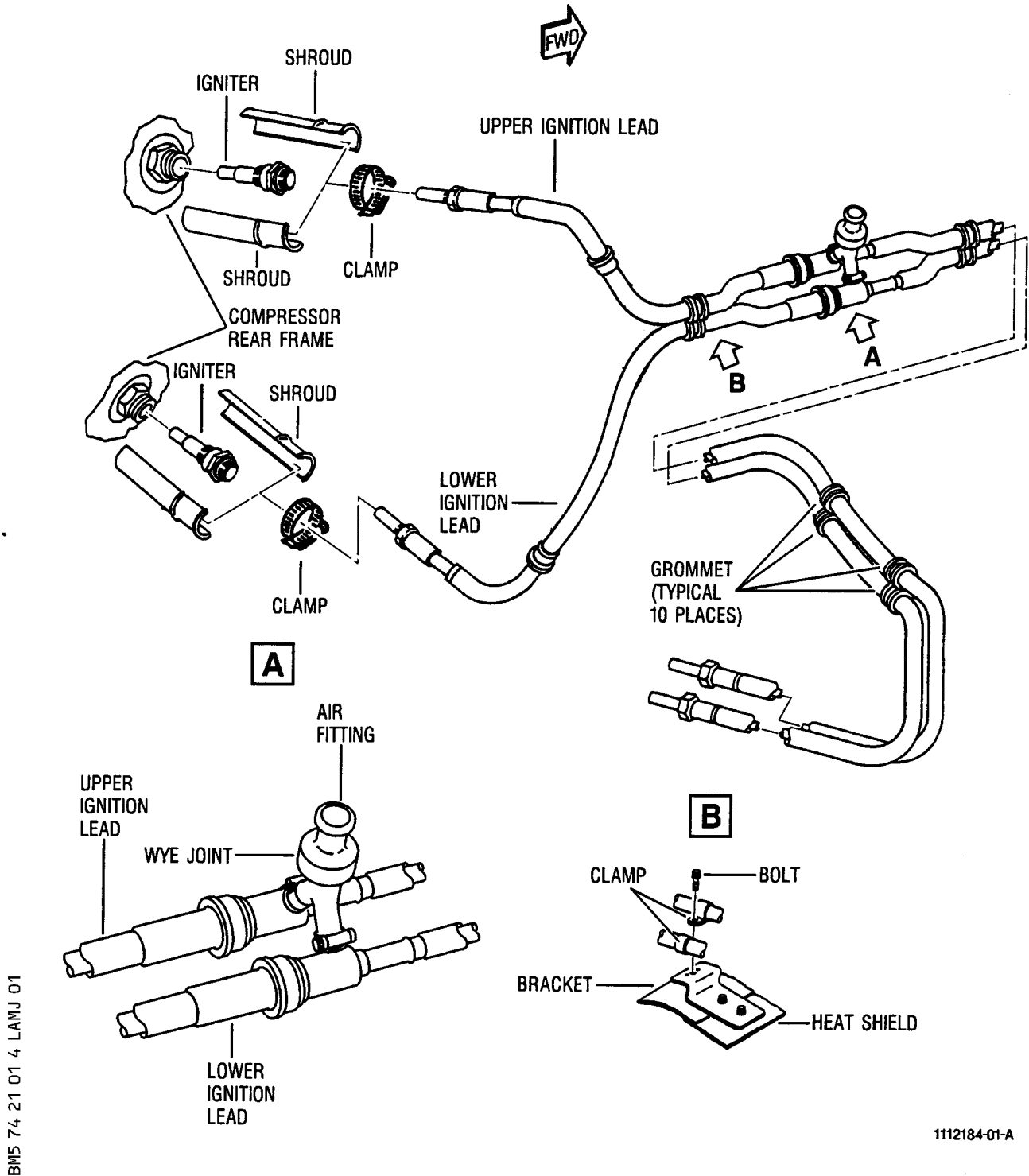
Ignition Leads Removal/Installation  
(Type 3) (Sheet 1/2)  
Figure 401

R EFFECTIVITY: 001-100,

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Ignition Leads Removal/Installation  
(Type 4) (Sheet 2/2)  
Figure 401

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**AIRCRAFT MAINTENANCE MANUAL**

- (e) Connect lead to igniter plug. Make sure igniter plug is properly seated in adapter. TORQUE nut to between 276 and 348 lbf.in. 3.12 and 3.93 m.daN) and wirelock.
- (f) Lock hinged loop clamps by turning bolt 1/4 turn CW.

**D. Test and Close-Up**

- (1) Carry out test of ignition system (Ref. 74-00-00, P. Block 501).
- (2) Make certain that working area is clean and clear of tools and miscellaneous items of equipment.
- (3) Remove access platform.
- (4) Close cowl doors remove safety clips and tags and close circuit breakers (Ref. 71-13-00, P. Block 301).

End Pre GE SB 74-002

GE SB 74-002 XXX (IMPROVED IGNITION LEADS, IGNITER PLUGS, AND IGNITION SYSTEM HARDWARE).

**4. Procedure**

**A. Job Set-Up**

- (1) Open, safety, and tag the appropriate circuit breakers and open cowl doors (Ref. 71-13-00, P. Block 301).
- (2) Install access platform.

**B. Removal (Ref. Fig. 401, 403, 402)**

**WARNING** : IGNITION VOLTAGE IS DANGEROUSLY HIGH AND CAN CAUSE SERIOUS INJURY OR DEATH. DO NOT OPERATE THE IGNITION SYSTEM FOR FIVE MINUTES BEFORE YOU REMOVE THE IGNITION COMPONENTS. MAKE SURE YOU GROUND THE EXCITER OUTPUT TERMINAL AFTER YOU DISCONNECT THE IGNITER PLUG CABLE.

- (1) Disconnect ignition lead clamp adjacent to igniter plug.  
**NOTE** : Turn clamp lock one quarter turn counterclockwise.
- (2) Remove shroud and clamp covering igniter plug.
- (3) Disconnect the ignition lead at the igniter and ground the ignition lead terminal to the engine case.
- (4) Remove the seal from the ignition lead.
  - (a) Discard the seal.
  - (b) Install the protection caps or plugs.
- (5) Disconnect the ignition lead from the ignition exciter 1 or 2.  
Install protective caps and/or plugs.

Pre SB GE 74-007

- (6) Not applicable

End Pre SB GE 74-007

Post SB GE 74-007 \*\*\* (ADD A BRACKET TO SUPPORT THE IGNITION LEAD)

- (6) Remove the bolt and clamps that secure the ignition leads to the bracket on the heat shield.

End Post SB GE 74-007

- (7) Remove bolt and retainer securing lead to oil tank forward outlet tube.

**CAUTION** : IGNITION LEAD CONNECTORS ARE TO BE ENGAGED AND DISENGAGED USING STRAIGHT AXIAL PUSH OR PULL FORCES ONLY. NO WIGGLING OR SIDE-TO-SIDE FLEXING OF THE LEAD IS PERMITTED.

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- (8) Remove bolts attaching adapters. Remove adapter and grommet.  
**NOTE** : Retain grommets for installation on new lead if serviceable.
- (9) Remove retainer by removing bolts.
- (10) Remove clamp by removing bolts, washers, and nuts.
- (11) Remove hose clamps and leads from WYE joint securing leads to cooling air manifold.
- (12) Remove lead from bracket just aft of WYE joint by removing clamp, bolt, washer, and nut.
- (13) Unlock hinged loop clamps securing lead to engine by turning bolt one quarter counterclockwise.
- (14) Remove lead and install protective caps and plugs.

**C. Installation (Ref. Fig. 401, 403, 402)**

- (1) Remove protective caps and plugs.

**CAUTION** : IGNITION LEAD CONNECTORS ARE TO BE ENGAGED AND DISENGAGED USING STRAIGHT AXIAL PUSH OR PULL FORCES ONLY. NO WIGGLING OR SIDE-TO-SIDE FLEXING OF THE LEAD IS PERMITTED.

- (2) Insert exciter end of lead through top of lower pylon fireseal and install serviceable slotted grommets on new ignition lead (1).
- (3) Route lead into position and install into hinged loop clamps. Make sure slotted grommets are properly located at fireseals.
- (4) Connect lead to ignition exciter. Hand tighten coupling nut.
- (5) Loosen lead knurled nut to allow each lead to freely rotate.
- (6) Position lead cooling tube ends through hose clamps and into legs of WYE joint. Tighten hose clamps around each leg of WYE joint and lead tube ends.
- (7) Install adapters and TORQUE bolts to between 55 and 70 lbf.in. (0.62 and 0.79 m.daN).
- (8) Attach clamps with bolts, washers, and nuts. TORQUE nuts to between 33 and 37 lbf.in. (0.37 and 0.42 m.daN).
- (9) Install retainer with bolts TORQUE bolts to between 33 and 37 lbf.in. (0.37 and 0.42 m.daN).

Pre SB GE 74-007

- (10) Not applicable

End Pre SB GE 74-007

Post SB GE 74-007 \*\*\* (ADD A BRACKET TO SUPPORT THE IGNITION LEAD)

- (10) Secure the ignition leads to the bracket on the heat shield with bolt and clamps. TORQUE bolt to between 33 and 37 lbf.in. (0.37 and 0.42 m.daN).

End Post SB GE 74-007

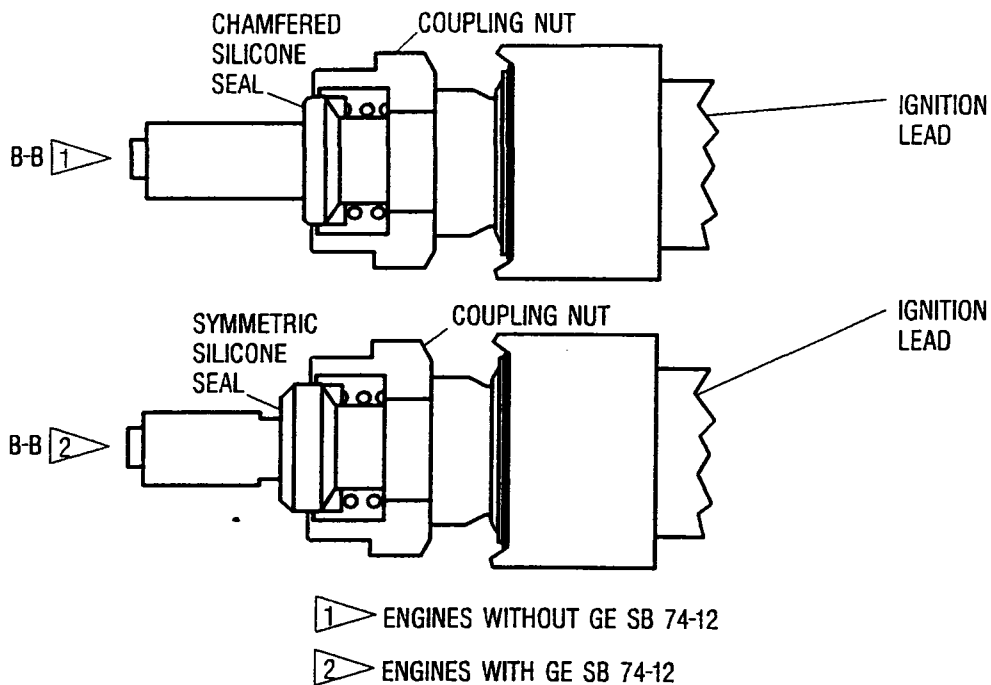
- (11) Secure lead to the oil tank forward outlet tube with retainer and bolt. TORQUE bolts to between 24 and 27 lbf.in. (0.27 and 0.30 m.daN).
- (12) Install the seal on the ignition lead (Type 4 ignition system).  
**NOTE** : There are two different types of silicone seal (chamfered and symmetric). You must make sure the correct seal is installed.
- (13) Connect lead to igniter plug. Make sure igniter plug is properly seated in adapter.
- (14) Lock hinged loop clamps by turning bolt one-quarter turn clockwise.  
**NOTE** : If a new clamp is being installed, turn bolt an additional 1 to 1 1/2 turns to establish proper lock-spring tension.
- (15) Add chafing shield and silicone tape to portion of ignition leads which

R EFFECTIVITY: 001-100,

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Ignition Lead Installation  
Figure 402

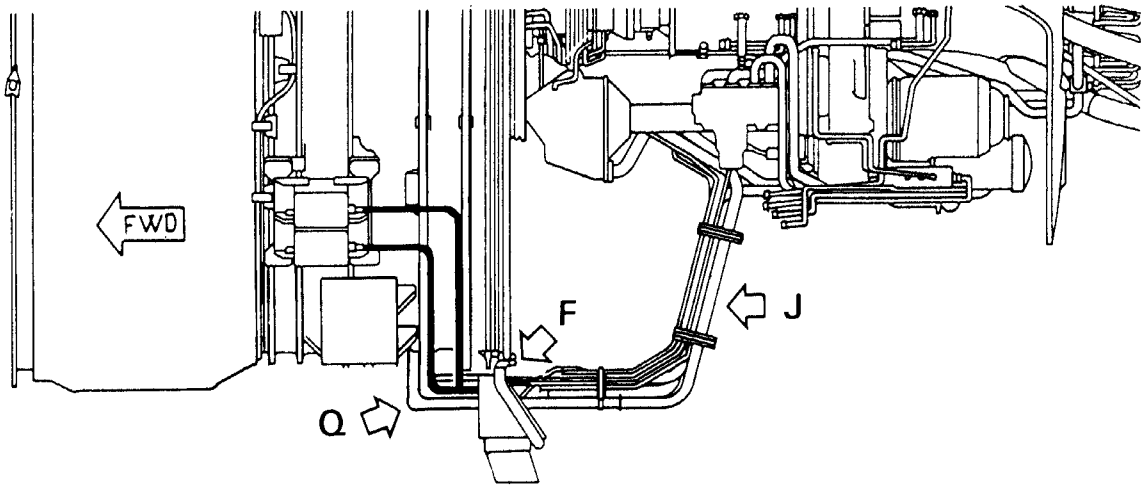
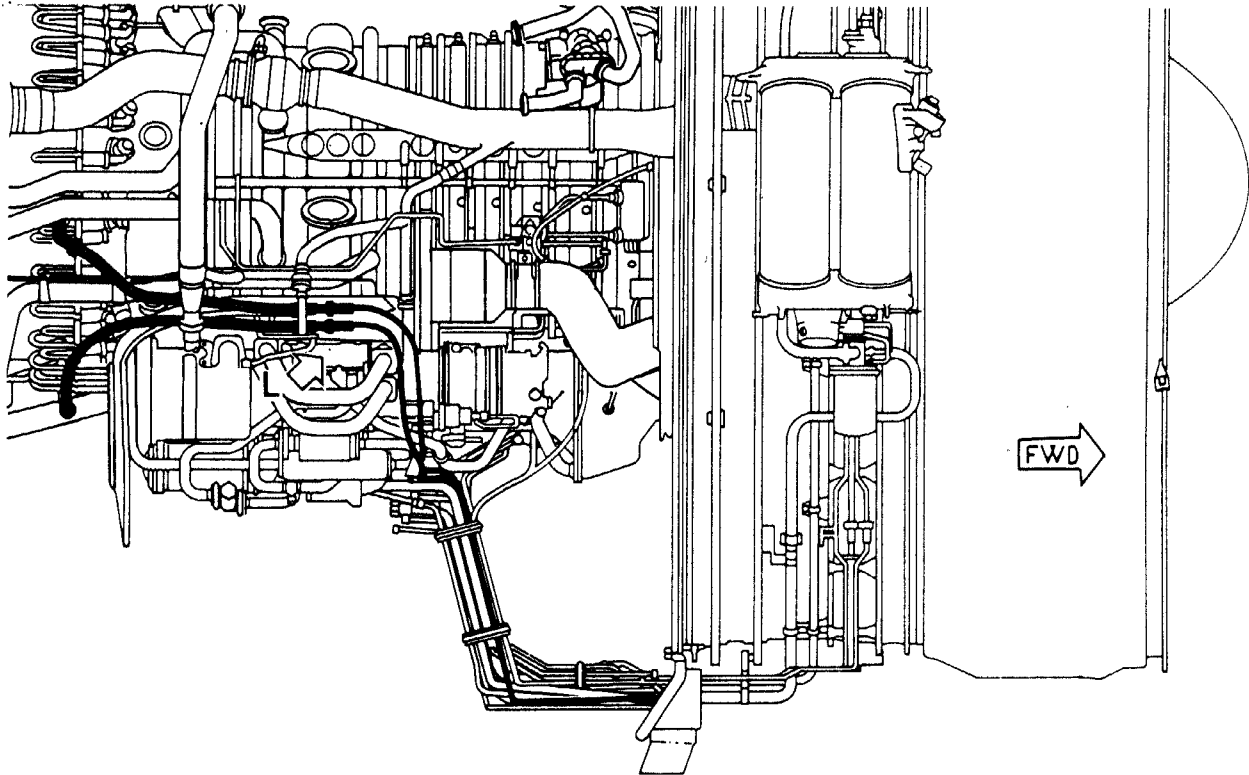
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Ignition Leads - Removal/Installation (Sheet 1/4)

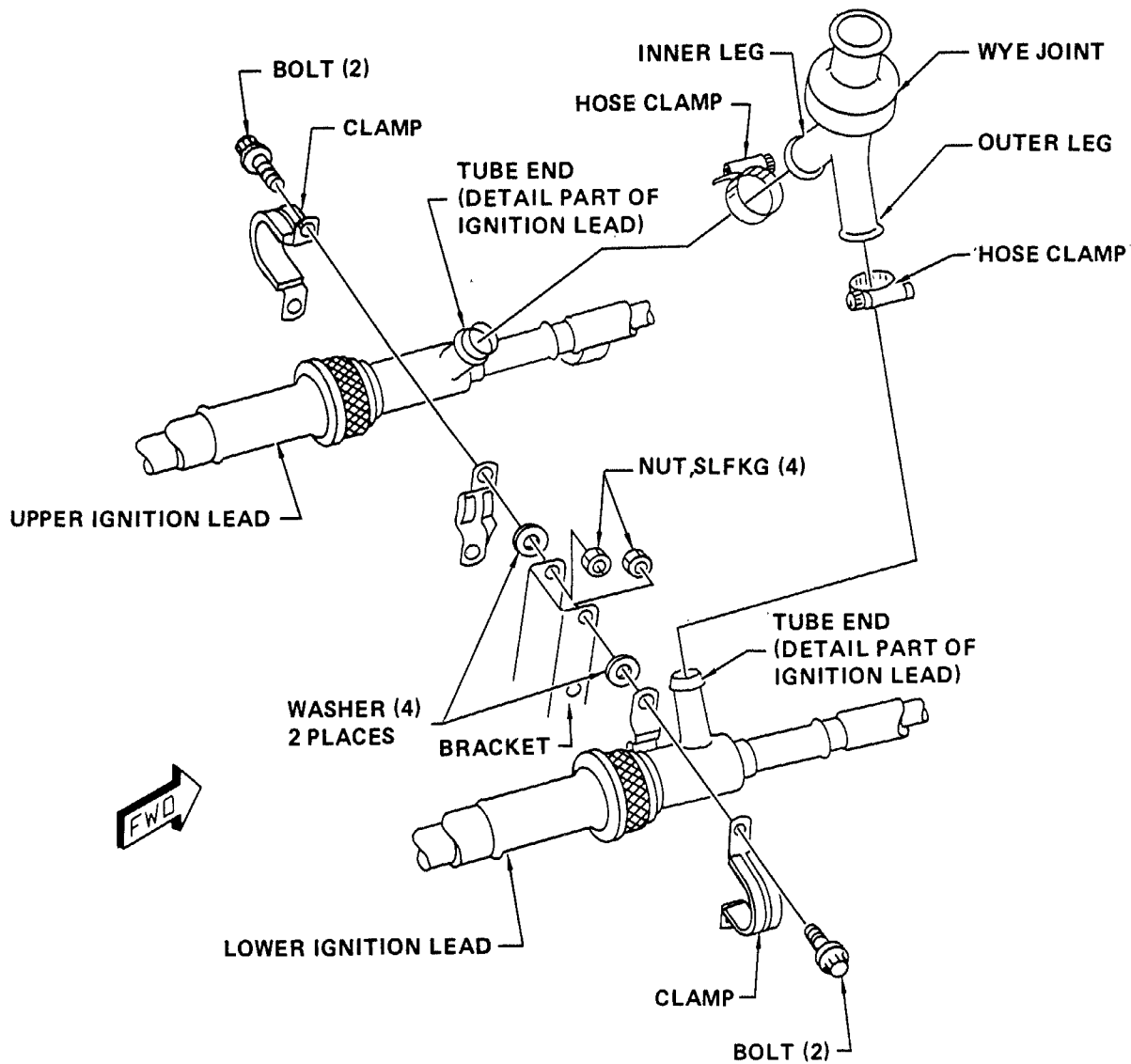
Figure 403

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Ignition Leads - Removal/Installation (Sheet 2/4)  
Figure 403

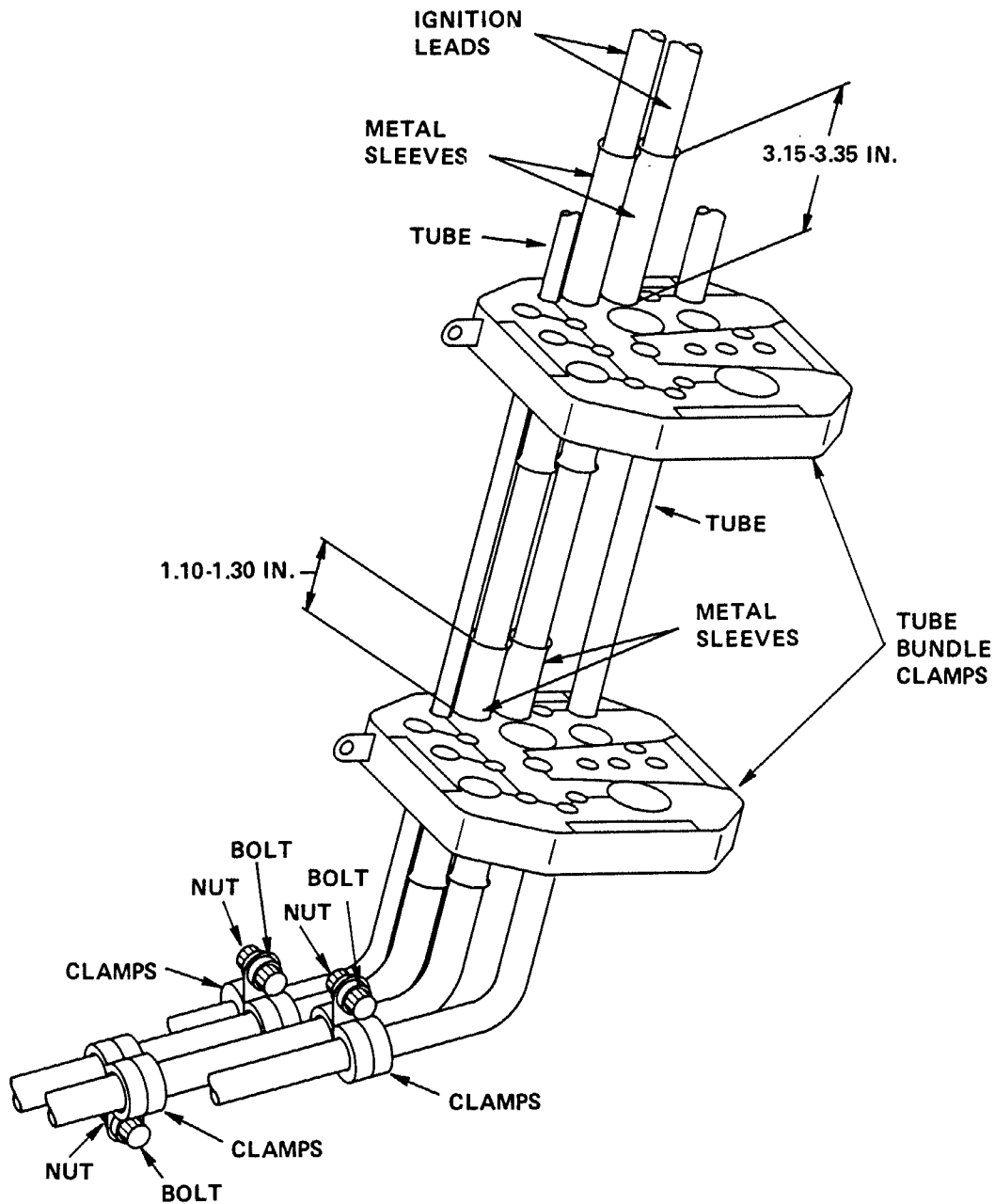
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**J**



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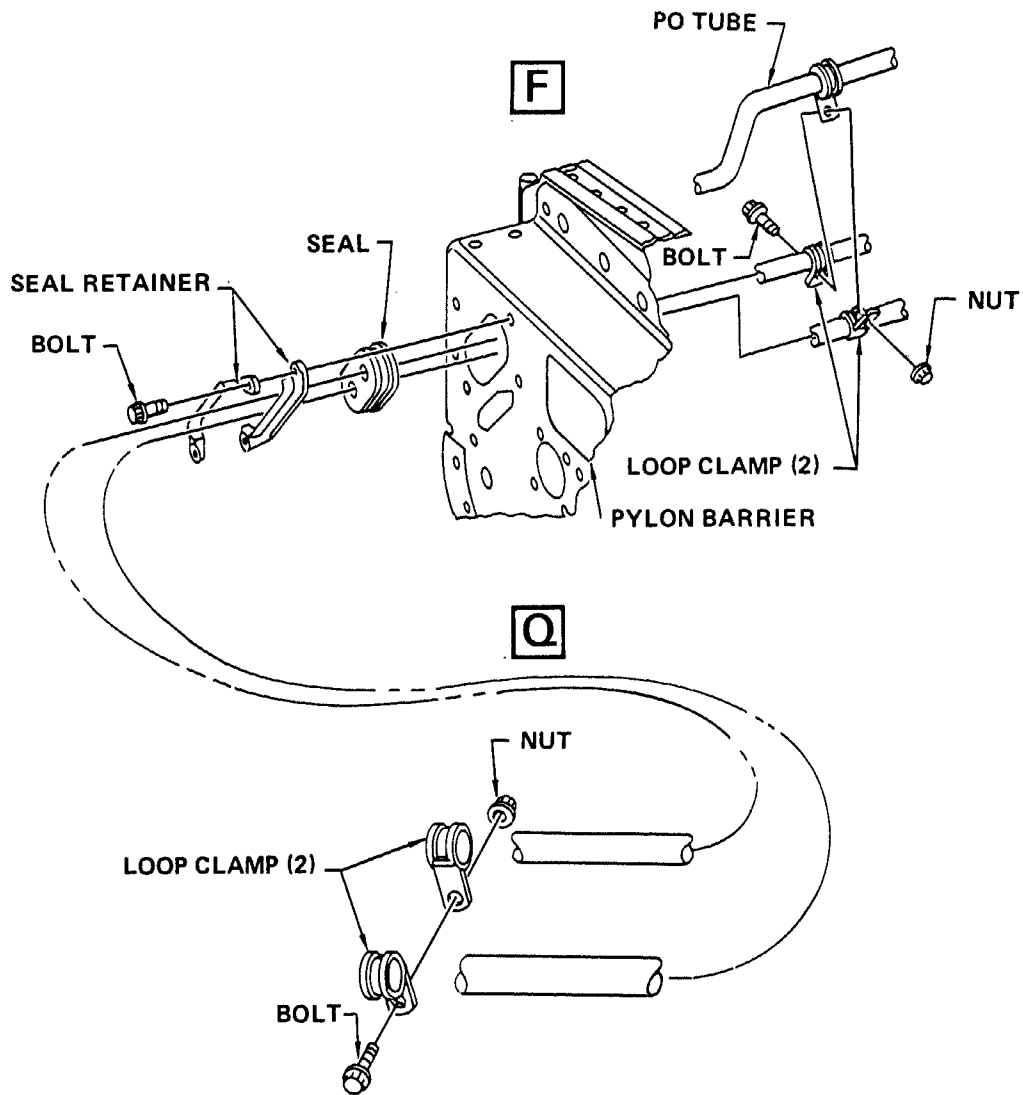
Ignition Leads - Removal/Installation (Sheet 3/4)  
Figure 403

R EFFECTIVITY: 001-100,

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Ignition Leads - Removal/Installation (Sheet 4/4)  
Figure 403

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**AIRCRAFT MAINTENANCE MANUAL**

crosses over the aft fan cast T-ring and stiffeners.

**D. Make final ignition lead connections as follows:**

- (1) Starting at ignition exciter, loosen clamps and retighten as required to obtain optimum routing of ignition leads.
- (2) Tighten lead coupling nut at exciter. TORQUE to between 140 and 160 lbf.in. (1.58 and 1.80 m.daN).
- (3) Install the seal on the ignition lead (Type 4 ignition system).
- (4) Connect ignition lead to igniter plug. TORQUE coupling nut to between 260 and 290 lbf.in. (2.94 and 3.28 m.daN).

**NOTE** : After tightening, check tightness of igniter terminal by hand. If movement occurs loosen and retighten.

- (5) Install two ignition shrouds around each igniter plug and secure with clamp.
- (6) Seat ignition lead knurled nut by hand while wiggling large diameter flared ferrule. Apply final torque using teflon-jawed connector pliers. Tighten until plier slippage occurs. Wirelock.
- (7) Install clamps to bracket just aft of WYE joint and secure with bolts, washers, and nuts. TORQUE nuts to between 55 and 70 lbf.in. (0.62 and 0.79 m.daN).
- (8) Inspect ignition leads for proper routing, making sure that there are no kinks or binds and supporting hardware is secured.

**E. Perform audible check of ignition system**

**F. Test and Close-Up**

- (1) Carry out test of ignition system (Ref. 74-00-00, P. Block 501).
  - (2) Make certain that working area is clean and clear of tools and miscellaneous items of equipment.
  - (3) Remove access platform.
  - (4) Close cowl doors (Ref. 71-13-00, P. Block 301).
- Remove safety clips and tags and close circuit breakers.

End GE SB 74-002

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## AIRCRAFT MAINTENANCE MANUAL

### IGNITION LEADS - INSPECTION/CHECK

#### 1. Equipment and Materials

| ITEM                                             | DESIGNATION                                        |
|--------------------------------------------------|----------------------------------------------------|
| A.                                               | Access Platform                                    |
| B.                                               | Circuit Breaker Safety Clips                       |
| C. Material No.C04-002                           | Cleaning Compounds and Solvents<br>(Ref. 70-00-00) |
| Referenced Procedure<br>- 71-13-00, P. Block 301 | Cowl Doors                                         |

#### 2. Procedure

##### A. Job Set-Up

- (1)Open, safety, and tag the appropriate circuit breaker and open fan and thrust reverser cowl doors (Ref. 71-13-00, P. Block 301).
- (2)Install the access platform.

##### B. Visually examine as follows :

| INSPECT/CHECK                                                                                                                                                                              | MAXIMUM SERVICEABLE LIMITS                 | REMARKS                                                                                     |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|---------------------------------------------------------------------------------------------|
| (1)Electrical Connectors for :                                                                                                                                                             |                                            |                                                                                             |
| (a)Cracked or chipped insulator                                                                                                                                                            | None permitted                             | Replace the lead                                                                            |
| (b)Socket arcing                                                                                                                                                                           | None permitted                             | Replace the lead                                                                            |
| <b><u>WARNING</u> : THIS SOLVENT IS TOXIC AND SHOULD BE USED WITH ADEQUATE VENTILATION. DO NOT BREATHE THE VAPORS. CONTACT WITH THE SKIN WILL REMOVE OILS AND CAUSE SEVERE DERMATITIS.</b> |                                            |                                                                                             |
| (c)Too much carbon in the socket at the igniter plug end of the lead                                                                                                                       | None permitted                             | Replace the igniter plug. Clean the socket with a soft bristle brush and solvent (C04-002). |
| <b><u>NOTE</u> : Too much soot in a socket identifies an igniter plug is faulty or has leaks.</b>                                                                                          |                                            |                                                                                             |
| (d)Socket distorted or bent                                                                                                                                                                | None permitted                             | Replace the lead                                                                            |
| (e)Socket cross threaded                                                                                                                                                                   | None permitted                             | Replace the lead                                                                            |
| (f)Socket threads nicked or dented                                                                                                                                                         | Permitted if not through the thread height | Chase the threads, remove the high metal                                                    |

R EFFECTIVITY: 001-100,

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| INSPECT/CHECK | MAXIMUM SERVICEABLE LIMITS | REMARKS |
|---------------|----------------------------|---------|
|---------------|----------------------------|---------|

or replace the lead

(2)Braided Conduit for :

|                                |                                                   |                                                     |
|--------------------------------|---------------------------------------------------|-----------------------------------------------------|
| (a)Torn or frayed strands      | None permitted                                    | Replace the lead                                    |
| (b)Braze joint separation      | None permitted                                    | Replace the lead                                    |
| (c)Wear at the clamp locations | Light wear permitted. No broken or frayed strands | Replace the lead if the wear is more than the limit |

(3)Cooling Air Shroud for :

|                                  |                |                                            |
|----------------------------------|----------------|--------------------------------------------|
| (a)Leakage                       | None permitted | Replace the lead                           |
| (b)Obstruction at the exit holes | None permitted | Replace the lead or remove the obstruction |

C. Close-Up

- (1)Make sure that the working area is clean and clear of tools and miscellaneous items of equipment.
- (2)Remove the access platform.
- (3)Remove the safety clips and tags and close the circuit breakers. Close the thrust reverser and fan cowl doors (Ref. 71-13-00, P. Block 301).

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# AIRCRAFT MAINTENANCE MANUAL

## IGNITER PLUG - REMOVAL/INSTALLATION

### 1. Equipment and Materials

| ITEM                     | DESIGNATION                                              |
|--------------------------|----------------------------------------------------------|
| A.                       | Circuit Breaker Safety Clips                             |
| B. Material No.C02-058   | Antiseize Compounds, Lubricants, Oils<br>(Ref. 70-00-00) |
| C. Material No.C04-002   | Cleaning Compounds and Solvents<br>(Ref. 70-00-00)       |
| D.                       | Torque Wrench 276 - 348 lbf. in.<br>(3.12 - 3.93 m.daN). |
| E.                       | Access Platform                                          |
| F.                       | Corrosion Resistant Steel Lockwire                       |
| Referenced Procedures    |                                                          |
| - 71-13-00, P. Block 301 | Cowl Doors                                               |
| - 74-00-00, P. Block 501 | Ignition                                                 |

### 2. Procedure

- A. Job Set-Up
- (1)Open, safety and tag the appropriate circuit breakers and open fan and thrust reverser cowl doors (Ref. 71-13-00, P. Block 301).
- (2)Install access platform.

PRE GE SB 74-002 \*\*\* (NON IMPROVED IGNITOR PLUG)

- B. Removal of Igniter Plug (Ref. Fig. 401, 402)
- WARNING** : IGNITION VOLTAGE IS DANGEROUSLY HIGH AND CAN CAUSE SERIOUS INJURY OR DEATH. DO NOT OPERATE THE IGNITION SYSTEM FOR FIVE MINUTES BEFORE YOU REMOVE THE IGNITION COMPONENTS.  
MAKE SURE YOU GROUND THE EXCITER OUTPUT TERMINAL AFTER YOU DISCONNECT THE IGNITER PLUG CABLE.
- CAUTION** : IGNITION CABLE CONNECTORS ARE TO BE ENGAGED AND DISENGAGED USING STRAIGHT AXIAL PUSH OR PULL FORCES ONLY. NO WIGGLING OR SIDE-TO-SIDE FLEXING OF THE CABLE IS PERMITTED.

- NOTE** : It is not necessary to remove the igniter plug bushing and spacing gasket when you remove the igniter plug. An immersion depth check will be required if you remove the igniter plug bushing and spacing gasket.
- (1)Loosen the bolt a quarter turn and open the hinged loop clamp that attaches the ignition lead to the forward side of the heat shield bracket. Do this procedure again for the ignition lead on the aft side of the bracket.
- NOTE** : The bracket is installed on the aft side of the heat shield.
- (2)Disconnect the ignition lead from the igniter adapter and ground the ignition lead terminal to the engine case.
- (3)Remove igniter plug from adapter.
- (4)Remove gasket-spacers from igniter plug (Ref. Fig. 402) save for installation on replacement plug.

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**AIRCRAFT MAINTENANCE MANUAL**

**NOTE** : Count the gasket-spacers as they are removed so that the same number can be installed on the replacement plug.

**C. Installation of Igniter Plug.**

(1) Install gasket-spacers (same number) as removed from old plug onto replacement plug. (Ref. Fig. 401, 402).

(2) Insert igniter plug into adapter.

**CAUTION** : IGNITION CABLE CONNECTORS ARE TO BE ENGAGED AND DISENGAGED USING STRAIGHT AXIAL PUSH OR PULL FORCES ONLY. NO WIGGLING OR SIDE-TO-SIDE FLEXING OF THE CABLE IS PERMITTED.

**CAUTION** : LEAD MUST BE PROPERLY TIGHTENED TO PREVENT ARCING.

(3) Connect ignition lead to adapter ; TORQUE to between 276 and 348 lbf. in. (3.12 and 3.93 m.daN), and wirelock.

(4) Install the hinged loop clamp around the ignition lead on the forward side of the heat shield. Turn the bolt on the hinged loop clamp a quarter turn to attach it to the ignition lead. Do this procedure again for the ignition lead on the aft side of the bracket. TORQUE the clamp bolts to between 55 and 70 lbf.in. (0.62 and 0.79 m.daN).

END PRE GE SB 74-002

GE SB 74-002 \*\*\* (IMPROVED IGNITER PLUGS)

**D. Removal of the Type 4 igniter plug (Ref. Fig. 403)**

**WARNING** : IGNITION VOLTAGE IS DANGEROUSLY HIGH AND CAN CAUSE SERIOUS INJURY OR DEATH. DO NOT OPERATE THE IGNITION SYSTEM FOR FIVE MINUTES BEFORE YOU REMOVE THE IGNITION COMPONENTS.

MAKE SURE YOU GROUND THE EXCITER OUTPUT TERMINAL AFTER YOU DISCONNECT THE IGNITER PLUG CABLE.

R **NOTE** : It is not necessary to remove the igniter plug bushing and spacing  
R gasket when you remove the igniter plug. An immersion depth check  
R will be required if you remove the igniter plug bushing and spacing  
R gasket.

(1) Remove ignition shroud from around igniter plug.

(2) Disconnect the ignition lead from the igniter plug and ground the terminal of the ignition lead to the engine case.

(3) Remove the seal from the ignition lead and discard the seal (Type 4 ignition system).

(4) Remove the igniter plug from the adapter in the compressor rear frame.

**NOTE** : Do not remove the adapter and the spacing gasket when you remove the igniter plug. An immersion depth check will be necessary if you remove the adapter.

**E. Installation of the Type 4 igniter plug.**

**CAUTION** : ANTISEIZE COMPOUND MUST ONLY BE APPLIED TO THE IGNITER PLUG THREADS THAT ATTACH THE PLUG TO THE ADAPTER BUSHING. IF YOU APPLY ANTISEIZE COMPOUND IN OTHER AREAS IT CAN DAMAGE THE PLUG.

(1) Apply Material No.C02-058 to igniter plug threads.

(2) Install igniter plug into adapter.

**NOTE** : Immersion depth check is not necessary if the adapter was not removed.

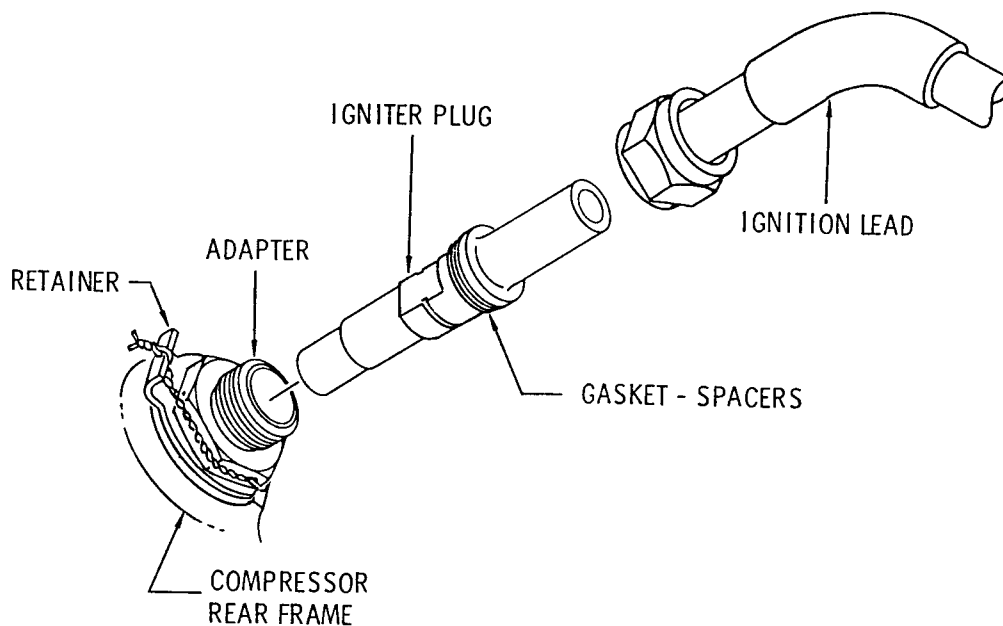
(3) TORQUE the igniter plug to between 260 and 290 lbf.in. (2.9 and

EFFECTIVITY: 001-100,

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BM5 74 21 02 4 LAMA - 00

Igniter Plug - Removal/Installation (Type 3)  
(Sheet 1/3)  
Figure 401

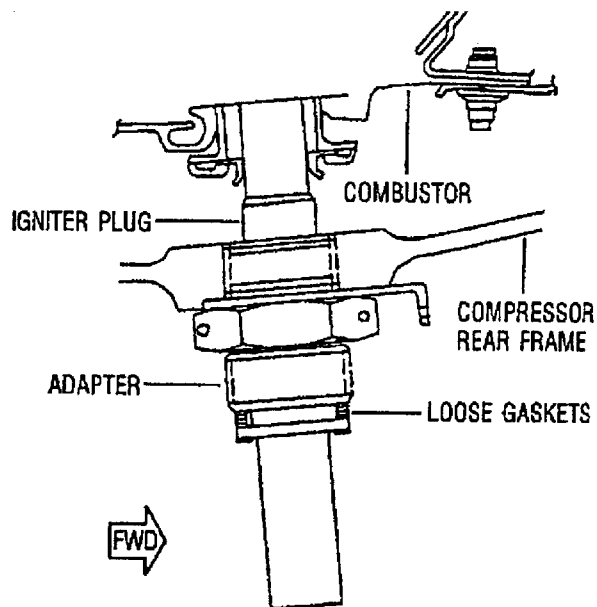
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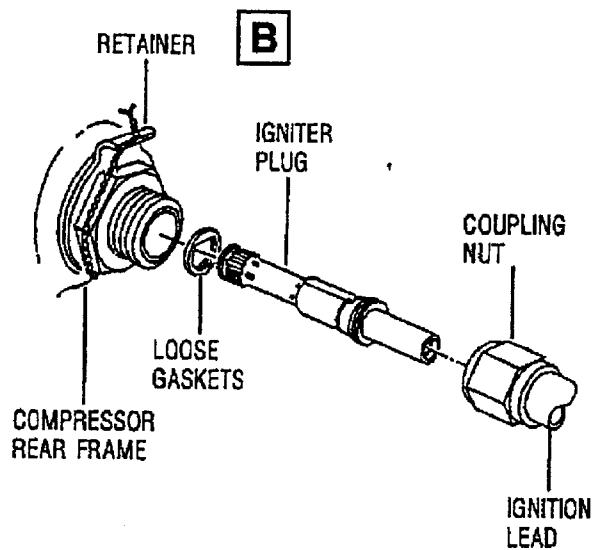
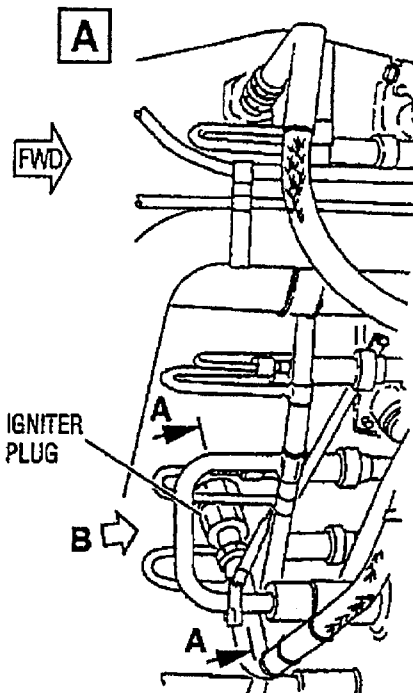
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**SECTION A-A**  
(VIEW WITH THE PLUG INSTALLED)



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Igniter Plug - Removal/Installation (Type 3)  
(Sheet 2/3)  
Figure 401

BM5 74 21 02 4 LAMJ 01

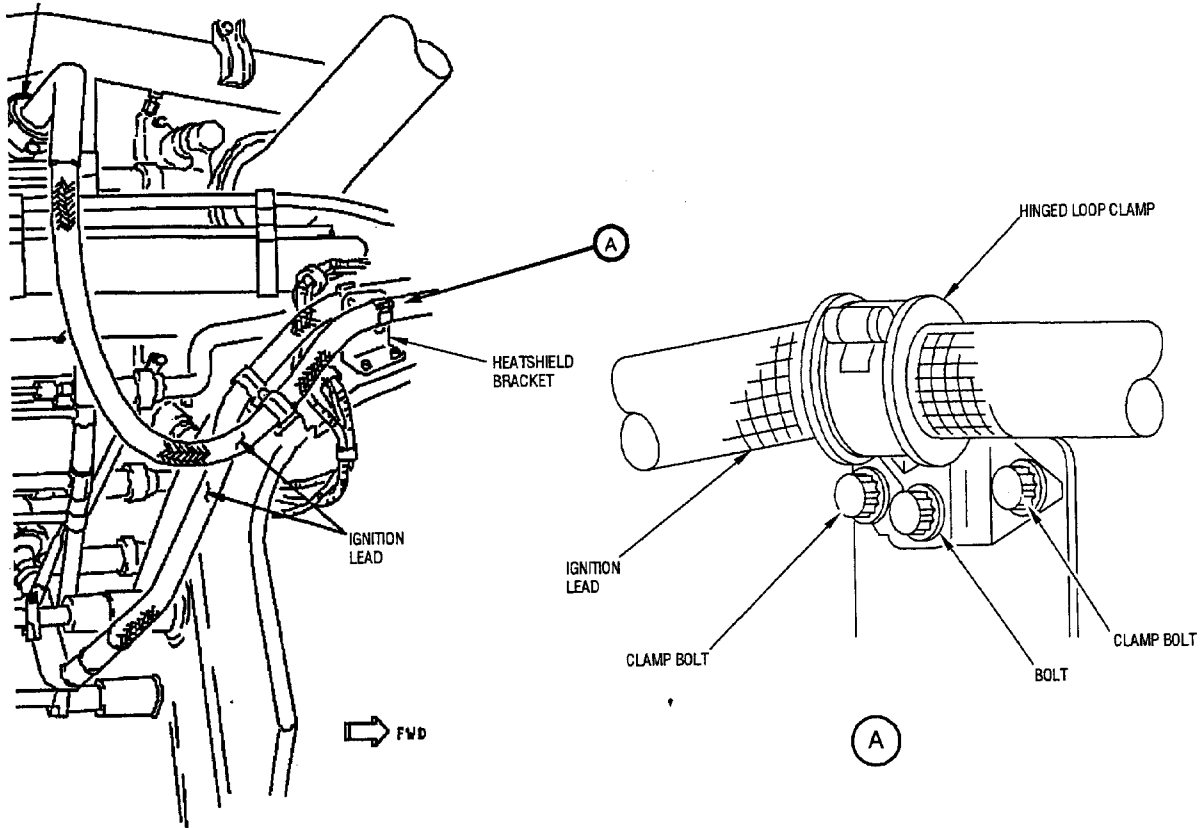
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1242196-00

Igniter Plug - Removal/Installation (Type 3)  
(Sheet 3/3)  
Figure 401

BMS 74 21 02 4 LAMS 00

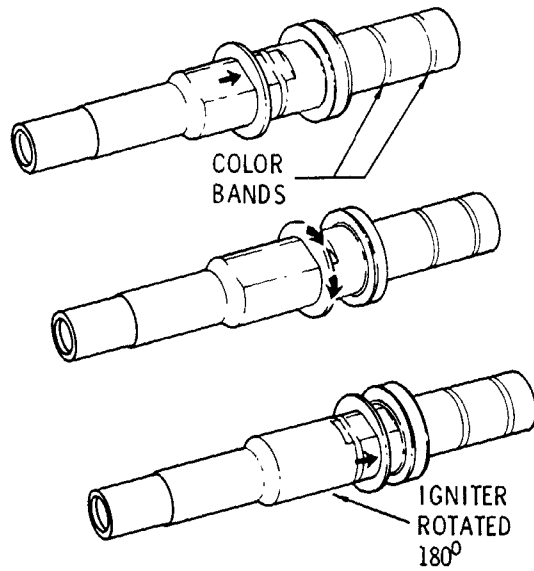
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BM5 74 21 02 4 LCMO - 13 - 08  
DM5

Gasket-Spacer - Removal/Installation  
Figure 402

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**AIRCRAFT MAINTENANCE MANUAL**

3.3 m.daN).

**CAUTION** : LEAD MUST BE PROPERLY TIGHTENED TO PREVENT ARCING

(4)Install the seal on the ignition lead (Type 4 ignition system).

**NOTE** : There are two different types of silicone seals (chamfered and symmetrical you must make sure the correct seal is installed.

(5)Connect ignition lead to igniter and TORQUE to between 260 and 290 lbf. in. (2.94 and 3.28 m.daN).

(6)Install ignition shroud around ignitor plug and secure with clamp.

(7)Connect igniter box input electrical plug.

(8)Remove safety clips and tags and close circuit breakers.

(9)Close fan and thrust reverser cowl doors.

END GE SB 74-002

**F. Close-Up**

(1)Carry out test of ignition system (Ref. 74-00-00, P. Block 501).

(2)Remove access platform.

(3)Make certain that working area is clean and clear of tools and miscellaneous items of equipment.

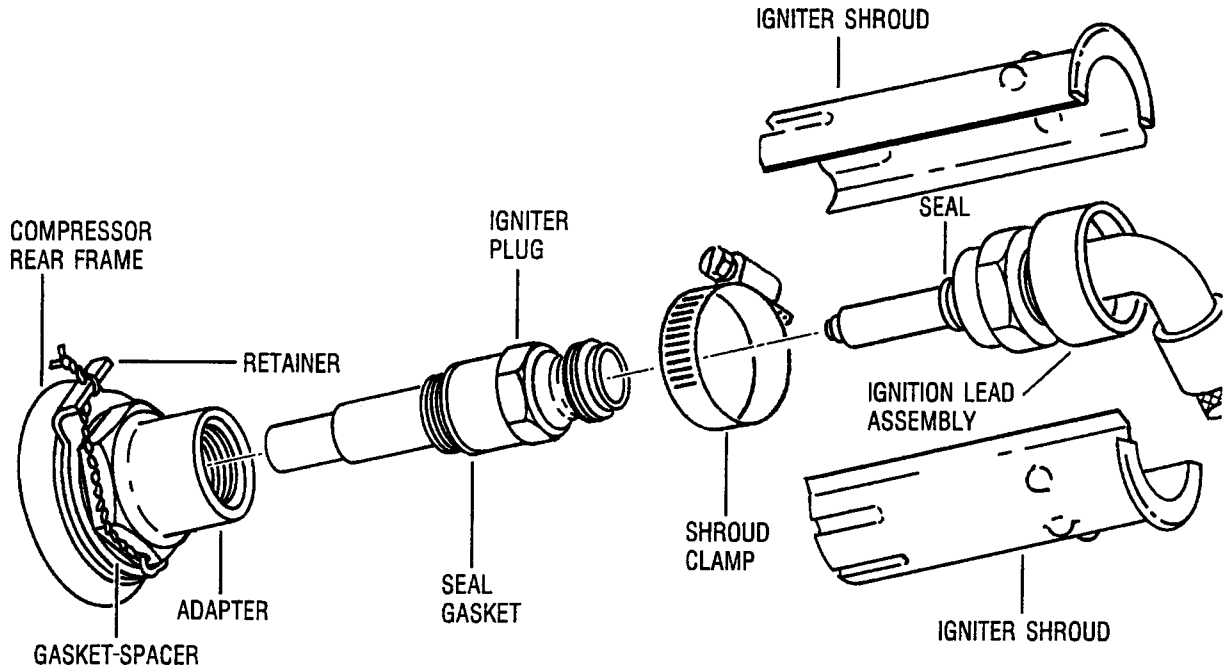
(4)Close fan and thrust reverser cowl doors (Ref. 71-13-00, P. Block 301).  
Remove safety clips and tags and close circuit breakers.

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Igniter Plug - (Type 4)  
(Sheet 1/3)  
Figure 403

BM5 74 21 02 4 LEMA 02

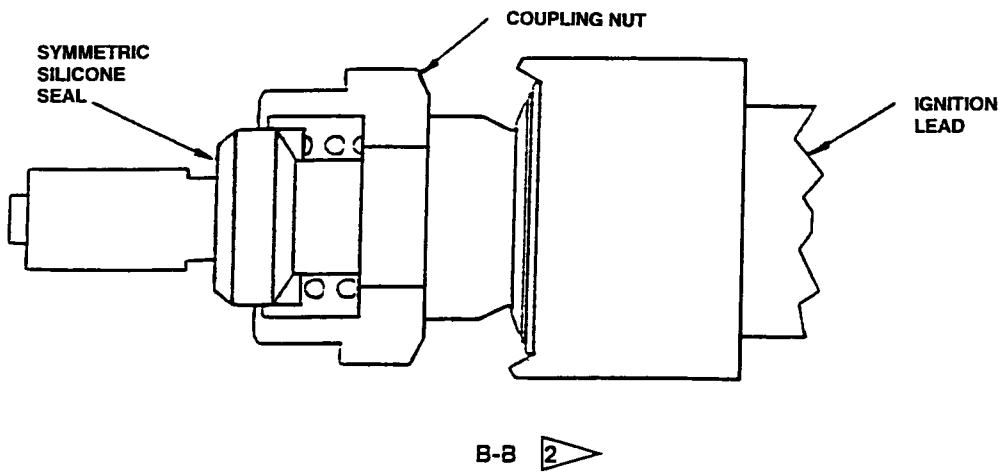
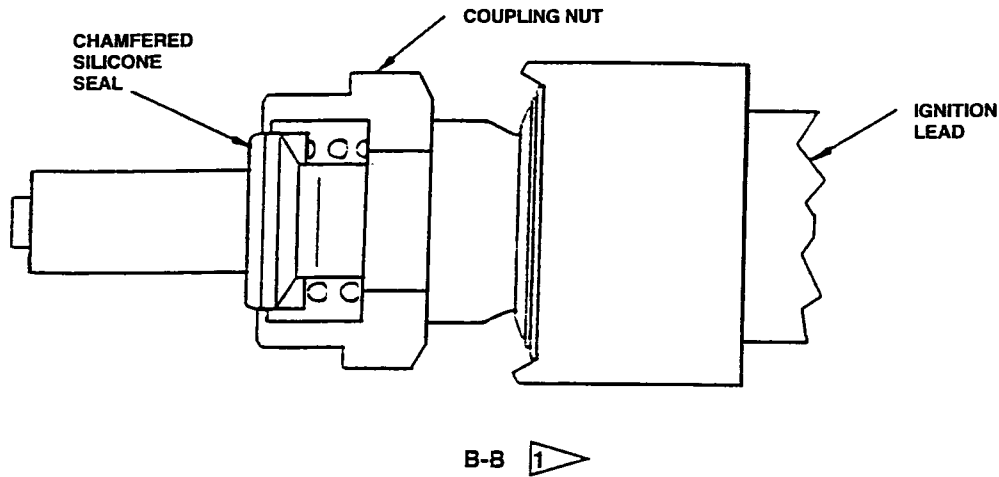
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BM5 74 21 02 4 LEMJ 00

- B-B 1

ENGINES WITHOUT GE SB 74-12
- B-B 2

ENGINES WITH GE SB 74-12

1130212-00-C

Igniter Plug - (Type 4)

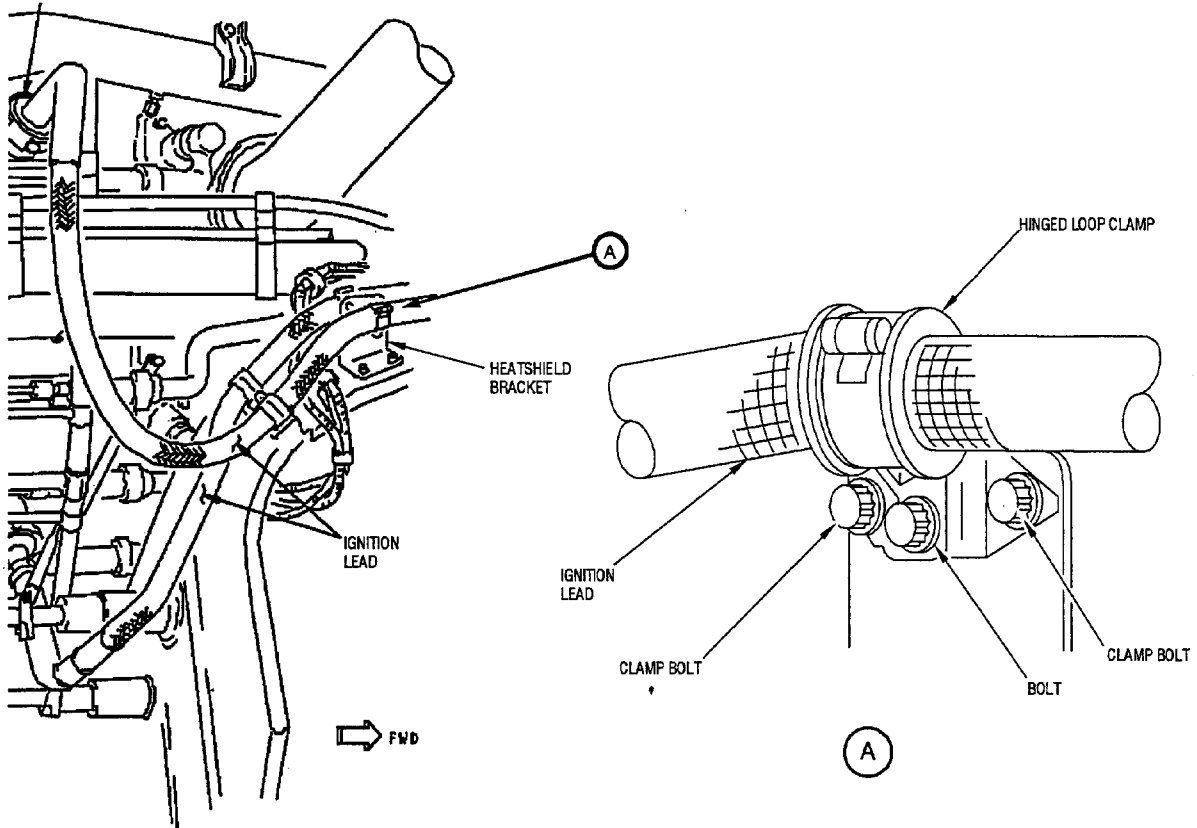
(Sheet 2/3)

Figure 403

EFFECTIVITY: 001-100,

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1242196-00

Igniter Plug - (Type 4)  
(Sheet 3/3)  
Figure 403

BMS 74 21 02 4 LEMS 00

R

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# AIRCRAFT MAINTENANCE MANUAL

## IGNITER PLUGS - INSPECTION/CHECK

### 1. Equipment and Materials

| ITEM                     | DESIGNATION                                                |
|--------------------------|------------------------------------------------------------|
| A.                       | Circuit Breaker Safety Clips                               |
| B.                       | Access Platform                                            |
| C. 2C6613                | Gage, Immersion Depth - Igniter Plug                       |
| D. Material No.C02-058   | Anti-Seize Compounds, Lubricants, Oils,<br>(Ref. 70-00-00) |
| Referenced Procedures    |                                                            |
| - 71-13-00, P. Block 301 | Cowl Doors                                                 |
| - 72-53-00, P. Block 601 | High Pressure Turbine Rotor Assembly                       |
| - 74-21-02, P. Block 401 | Igniter Plugs                                              |

### 2. Procedure

#### A. Job Set-Up

- (1)Open, safety and tag the appropriate circuit breakers and open cowl doors  
(Ref. 71-13-00, P. Block 301).
- (2)Install access platform.

#### B. Visual Inspection/Checks (Ref. Fig. 601)

- (1)Inspect the following :

| INSPECT/CHECK                                                                                                                                                                                                                                                                                                                              | MAXIMUM SERVICEABLE LIMITS | REMARKS                     |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|-----------------------------|
| (1)Examine the igniter plug tip for :                                                                                                                                                                                                                                                                                                      |                            |                             |
| (a)Cracks or holes<br>in the shell                                                                                                                                                                                                                                                                                                         | None permitted             | Replace the igniter<br>plug |
| (b)Cracks in the<br>ceramic                                                                                                                                                                                                                                                                                                                | None permitted             | Replace the igniter<br>plug |
| (c)Dimension X more<br>than 0.47 in.<br>(11.9 mm)                                                                                                                                                                                                                                                                                          | Not permitted              | Replace the igniter<br>plug |
| <b>NOTE</b> : This dimension is the maximum erosion limit for the shell. For best performance, it is recommended that the igniter plug not be reinstalled if the measured dimension is larger than 0.40 in. (10.2 mm). Uneven erosion patterns to the maximum limit are permitted if they do not total more than 20% of the circumference. |                            |                             |
| (d)Dimension Y more<br>than 0.27 in.<br>(6.9 mm)                                                                                                                                                                                                                                                                                           | Not permitted              | Replace the igniter<br>plug |
| <b>NOTE</b> : This dimension is the maximum erosion limit for the center electrode. For best performance, it is recommended that the                                                                                                                                                                                                       |                            |                             |

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| INSPECT/CHECK                                                                                                                                         | MAXIMUM SERVICEABLE LIMITS | REMARKS         |
|-------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|-----------------|
| igniter plug not be reinstalled if the measured dimension is larger than 0.21 in. (5.3 mm).                                                           |                            |                 |
| (2)Connector Well for :                                                                                                                               |                            |                 |
| (a)Dirt                                                                                                                                               | Any amount                 | Clean           |
| <b>NOTE</b> : A uniform sooty appearance extending to and including bottom of well indicates igniter should be replaced due to excessive gas leakage. |                            |                 |
| (3)Permanently Installed Gasket for :                                                                                                                 |                            |                 |
| (a)Nicks, dents or scratches on sealing surface                                                                                                       | None allowed               | Replace igniter |

**PREG SB 74-002 \*\*\* (NON-IMPROVED IGNITER PLUGS)**

**C. Dimensional Inspection/Check. Type 3 Plug (Ref. Fig. 602)**

(1)Measure for the correct immersion depth as follows :

(a)Remove the igniter plug (Ref. 74-21-02, P. Block 401).

(b)Remove the gasket-spacers from the igniter plug and keep them for later use.

(c)Measure Dimension A with a depth vernier with a hook scale. Measure Dimension A from the outer flange of the adapter to the outer flange of the ferrule or the igniter boss. Write the Dimension A on a piece of paper.

**NOTE** : Make sure you include the tool thickness.

(d)Use the chart in (Ref. Fig. 602) to find the correct number of gasket-spacers.

**NOTE** : The gasket-spacers thickness is 0.032 in. (0.81 mm).

(e)Install the igniter plug with the gasket-spacers (Ref. 74-21-02, P. Block 401).

**NOTE** : A immersion depth check is not necessary when you replace the plug only and install the same number of gasket-spacers on the new plug.

**END Pre GE SB74-002**

**GE SB 74-002 \*\*\* (IMPROVED IGNITER PLUGS)**

**D. Dimensional Inspection/Check. Type 4 Plug (Ref. Fig. 603)**

**NOTE** : Measuring igniter plug immersion depth is not necessary when plug is replaced provided the same number of gasket-spacers are used under the igniter plug adapter.

(1)Immersion Depth check for proper immersion depth.

(a)Remove plug from engine

(b)Remove adapter and spacer-gaskets

EFFECTIVITY: 001-100,

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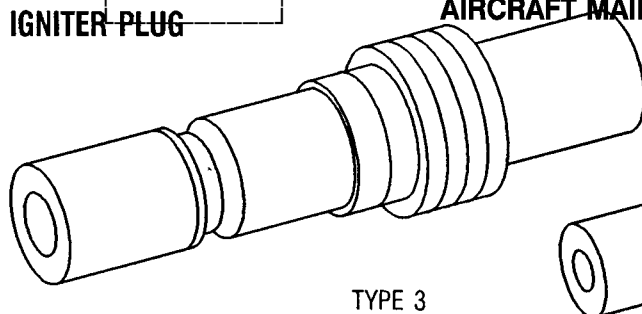
**74-21-02**

G E  
CF6 - 80C

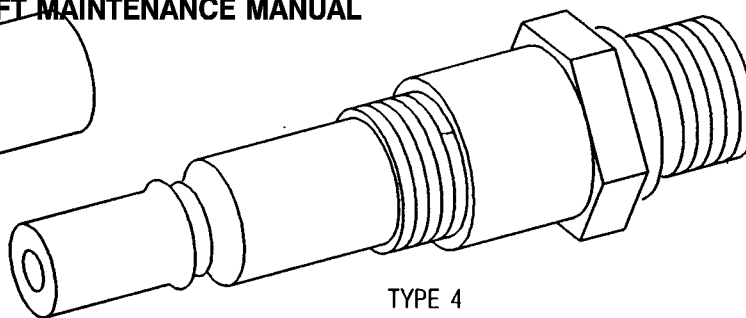
**A310**

**AIRCRAFT MAINTENANCE MANUAL**

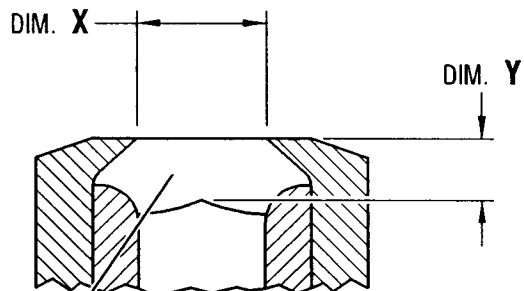
**IGNITER PLUG**



TYPE 3

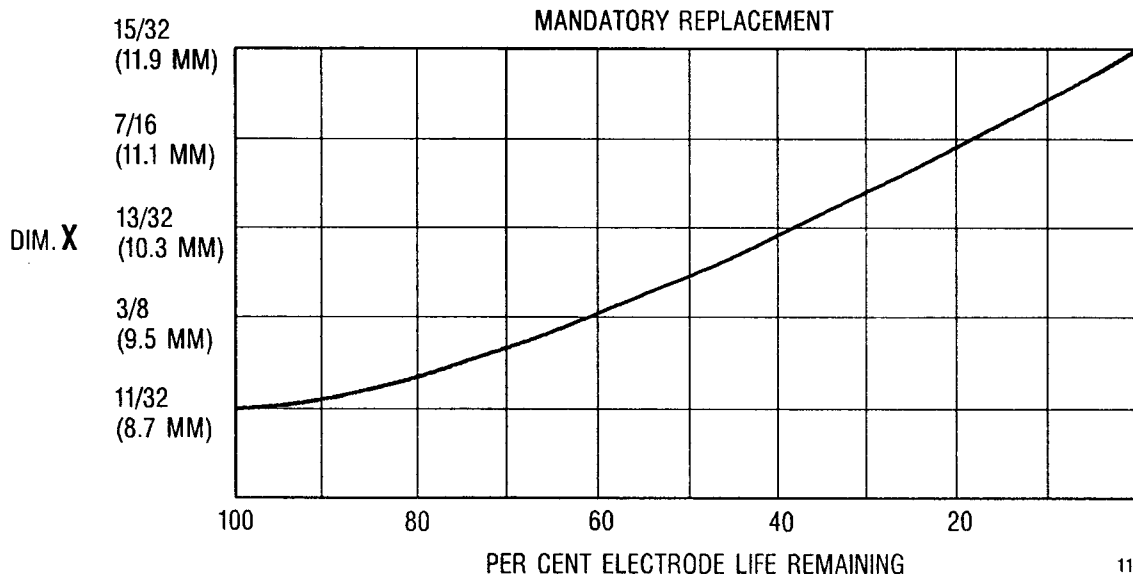
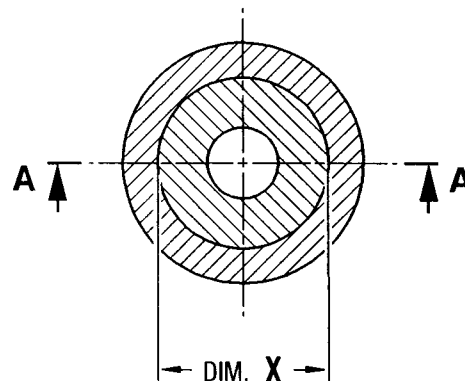


TYPE 4



EROSION OF  
INSULATOR  
AND CENTER  
ELECTRODE

**SECTION A-A**



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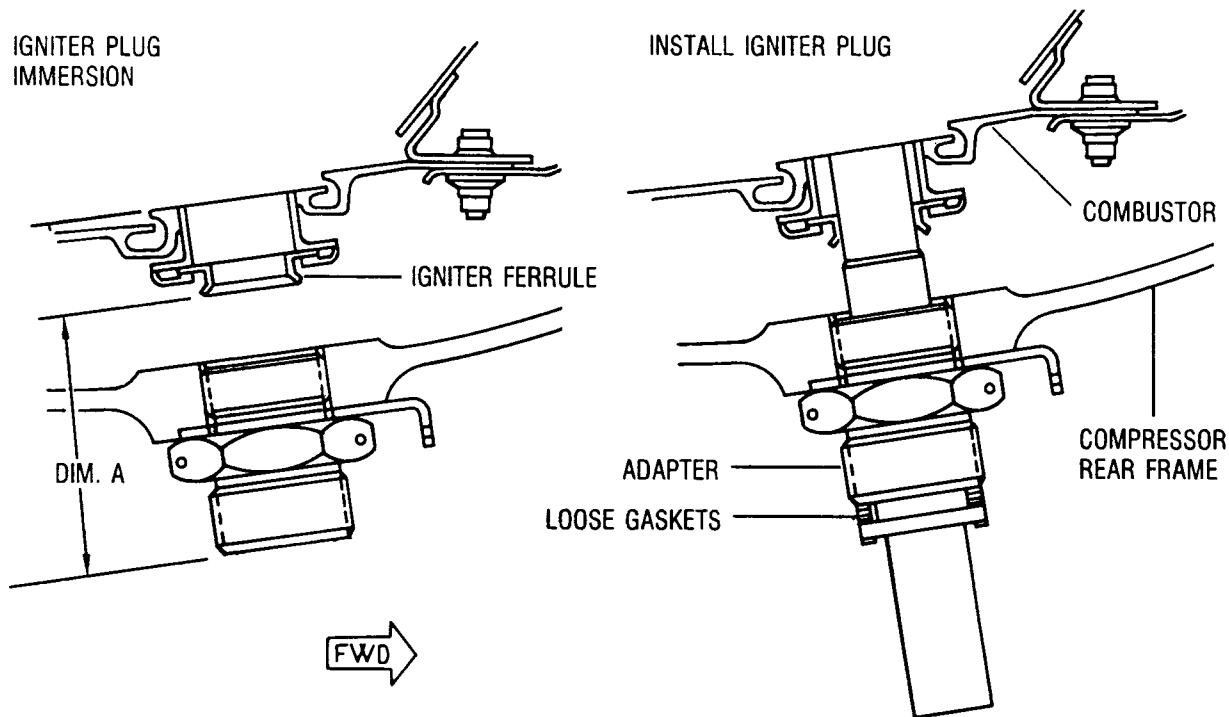
Igniter Plug Erosion Limits  
Figure 601

R EFFECTIVITY: 001-100,

PIA

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| DIMENSION "A" |             | NUMBER OF<br>LOOSE<br>GASKETS |
|---------------|-------------|-------------------------------|
| INCHES        | MILLIMETERS |                               |
| ≥ 2.177       | ≥ 55.30     | 0                             |
| 2.176-2.145   | 55.27-54.48 | 1                             |
| 2.144-2.113   | 54.46-53.67 | 2                             |
| 2.112-2.081   | 53.64-52.86 | 3                             |
| 2.080-2.048   | 52.83-52.02 | 4                             |
| 2.047-2.016   | 51.99-51.21 | 5                             |
| 2.015-1.984   | 51.18-50.39 | 6                             |
| 1.983-1.952   | 50.37-49.58 | 7                             |
| 1.951 ≥       | 49.56 ≥     | 8                             |

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1025092-01-A

Igniter Plug - Immersion Depth Check  
Figure 602

R

EFFECTIVITY: 001-100,

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**AIRCRAFT MAINTENANCE MANUAL**

(c) Using a depth vernier with hook scale, 2C6613, measure and record dimension A (Ref. Fig. 603) from compressor rear frame boss to outer flange of ferrule on igniter boss.

**NOTE** : Take into consideration tool thickness.

(d) From chart choose proper number of gaskets.

(e) If immersion depth is not within limit, add or remove gasket-spacers as required to bring within limit.

**NOTE** : Gasket thickness 0.032 in. (0.810 mm).

(f) Apply Material No. C02-058 to the thread of the adapter.

(g) Install seal ring, spacer-gaskets (as required) and adapter into compressor rear frame. TORQUE adapter to between 480 and 600 lbf.in. (5.4 and 6.8 m.daN).

(h) Apply Material No. C02-058 to igniter plug threads.

(i) Reinstall plug into adapter and TORQUE to between 260 and 290 lbf.in. (2.94 and 3.28 m.daN).

1 Safety the adapter with wire.

END GE SB74-002

**E. Close-Up**

(1) Remove safety clips and tag and close circuit breakers. Close cowl doors (Ref. 71-13-00, P. Block 301).

(2) Remove access platform.

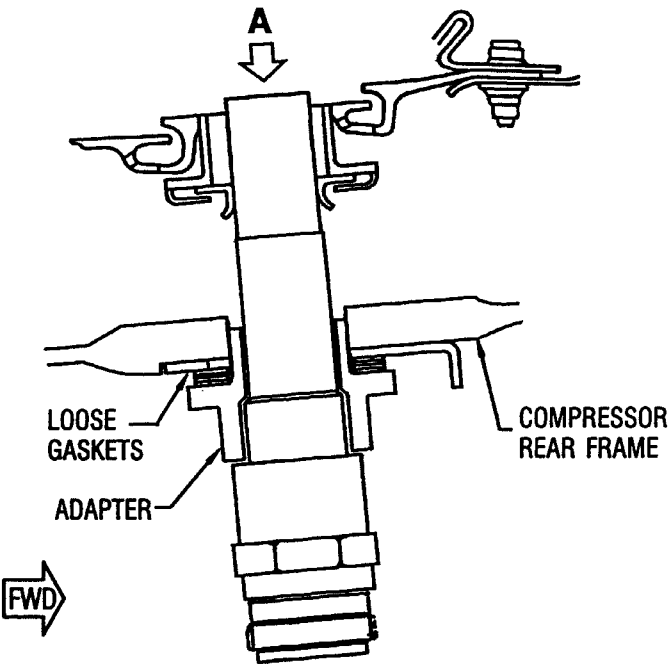
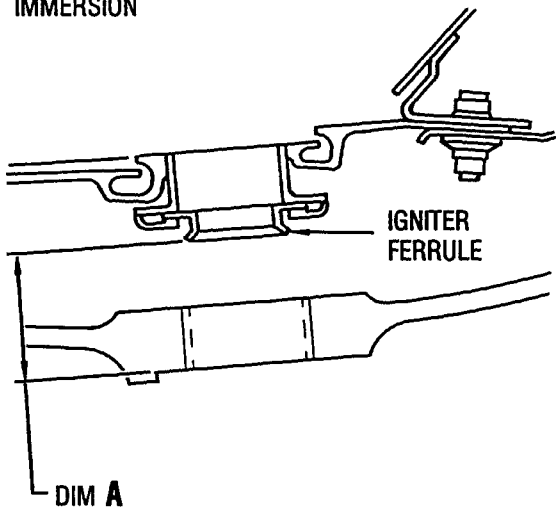
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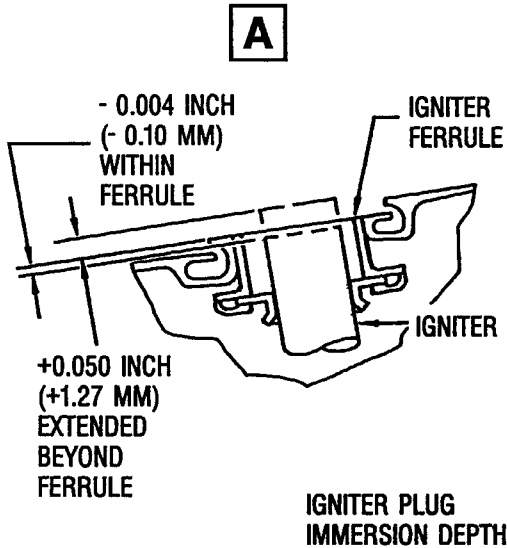
**74-21-02**

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DETERMINE  
IGNITER PLUG  
IMMERSION



USE LOOSE GASKETS IN ACCORDANCE  
WITH THIS TABLE



| DIMENSION A |             | NO. OF LOOSE GASKETS |
|-------------|-------------|----------------------|
| INCHES      | MILLIMETERS |                      |
| ≥ 1.067     | ≥ 27.10     | 0                    |
| 1.066-1.035 | 27.09-26.29 | 1                    |
| 1.034-1.003 | 26.28-25.48 | 2                    |
| 1.002-0.971 | 25.47-24.66 | 3                    |
| 0.970-0.938 | 24.65-23.83 | 4                    |
| 0.937-0.906 | 23.82-23.01 | 5                    |
| 0.905-0.874 | 23.00-22.20 | 6                    |
| 0.873-0.842 | 22.19-21.39 | 7                    |
| 0.841 ≥     | 21.38 ≥     | 8                    |

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BMS 74 21 02 6 LEMO - 01

Improved Igniter Plugs  
Figure 603

R EFFECTIVITY: 001-100,

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## AIRCRAFT MAINTENANCE MANUAL

### SWITCHING - DESCRIPTION AND OPERATION

#### 1. General

The ignition system is controlled from ENG START panel 429VU, HP fuel shut off levers and switches in N2 indicators.

#### 2. Description

(Ref. Fig. 001)

(Ref. Fig. 002, 003)

##### A. ENG START panel (429VU)

ENG START panel is located in the center of flight compartment overhead panel and features :

(1)An ignition (ENG START) selector switch common to both engines.

##### B. HP Fuel Shut-Off Valve Control Lever (9VU) (Ref. Fig. 004)

HP fuel shut off of valve control levers are located on the center pedestal, behind the throttle control levers.

They can be placed in ON or OFF position. In ON position, the ignition selector switch is supplied with 115 V - 400 Hz and the ignition sequence is initiated.

##### C. Microswitches in N2 Indicators (in panel 4VU)

N2 indicators are located on main instrument panel center section. The microswitch inside each N2 indicator enables de-energization of the ignition relays when N2 reaches 45% by cutting off supply to the ignition exciter.

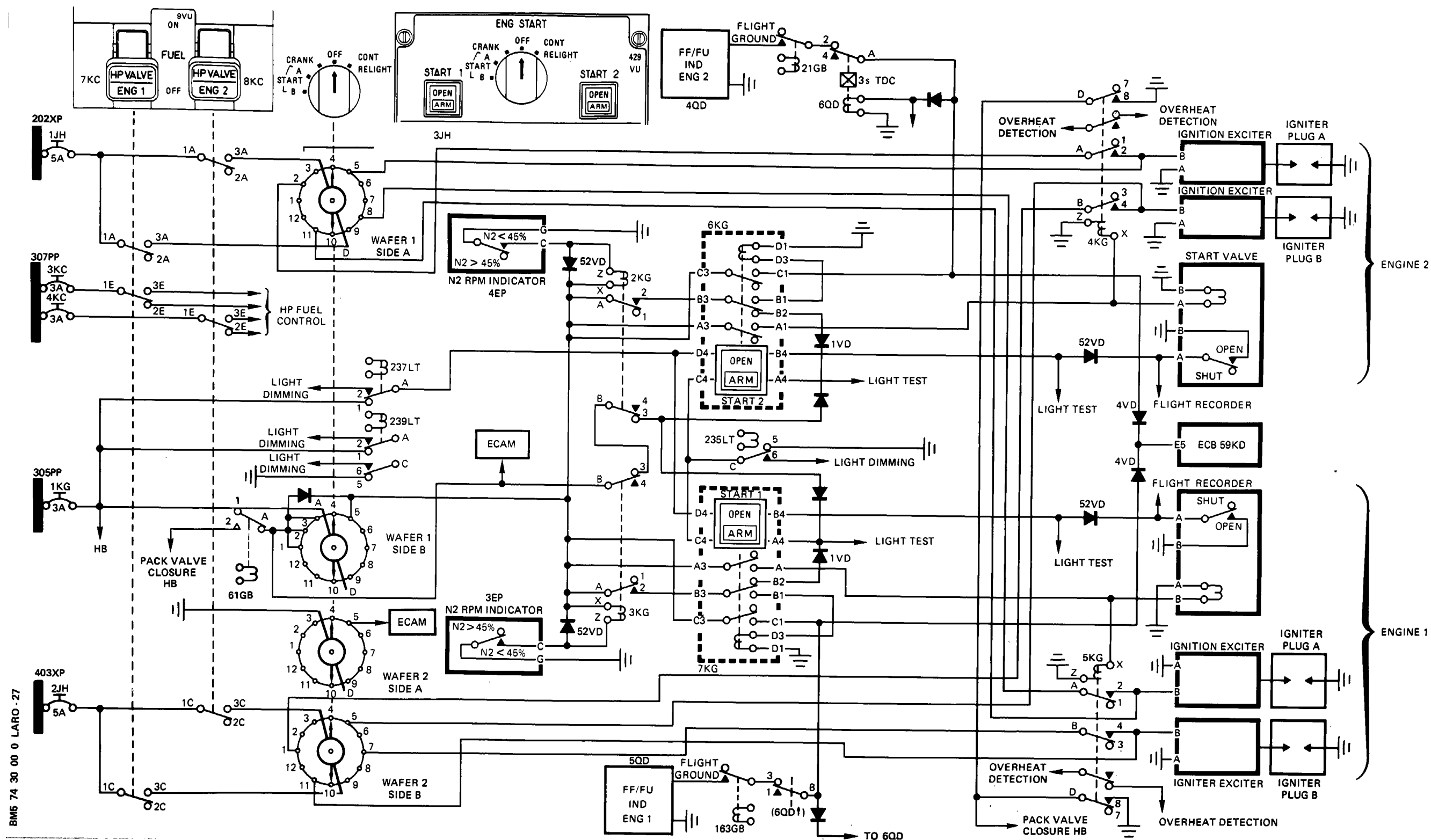
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Ignition System - Schematic  
Figure 001

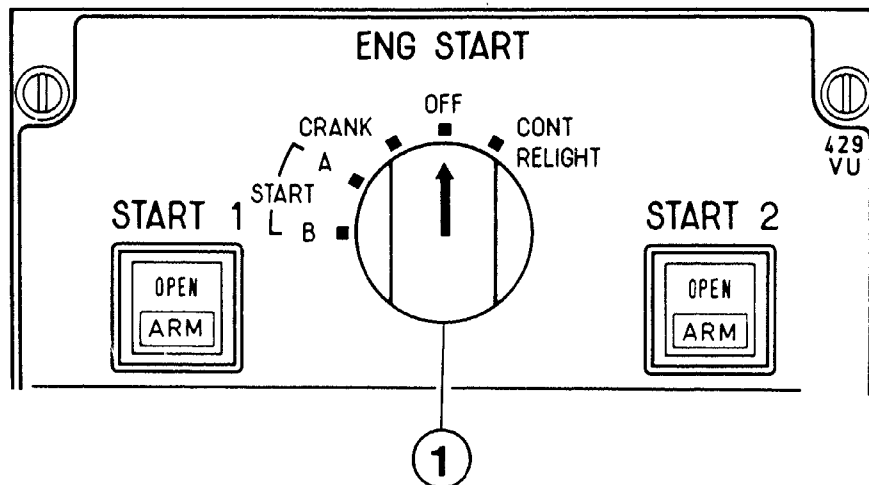
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1. IGNITION (ENG START) SELECTOR SWITCH  
USED TO SELECT IGNITION MODE REQUIRED

OFF – IGNITION SYSTEMS OF BOTH ENGINES ARE INHIBITED  
LATCHING OF ENG START ARM SEL PUSH-BUTTON SWITCH IS INHIBITED.

CRANK – – IGNITION SYSTEMS OF BOTH ENGINES ARE INHIBITED, BUT START SEQUENCE  
(REF 80.00.00) CAN BE INITIATED TO DRY OR WET MOTORING CYCLES.

START A (B) – IGNITION SYSTEM A (B) WILL BE ENERGIZED DURING ENGINE START SEQUENCE  
ONLY (REF 80.00.00)

IN CRANK AND START POSITIONS THE AIR CONDITIONING SYSTEM IS SHUT DOWN (PACK VALVES  
1 AND 2 CLOSED).

CONT RELIGHT – IGNITION SYSTEMS A AND B ARE ENERGIZED CONTINUOUSLY PROVIDED CORRES-  
PONDING HP FUEL SHUT OFF VALVE CONTROL LEVER IS ON POSITION.

THE ENGINE PAGE AUTOMATICALLY APPEARS ON THE R ECAM DISPLAY UNIT.

NOTE : IRRESPECTIVE OF HP FUEL SHUT OFF VALVE CONTROL LEVER POSITION, THE L ECAM  
DISPLAY UNIT WILL SHOW THE MESSAGE CONTINUOUS RELIGHT ON.

BM5 74 30 00 0 LCNO - 13 - 07  
DM5

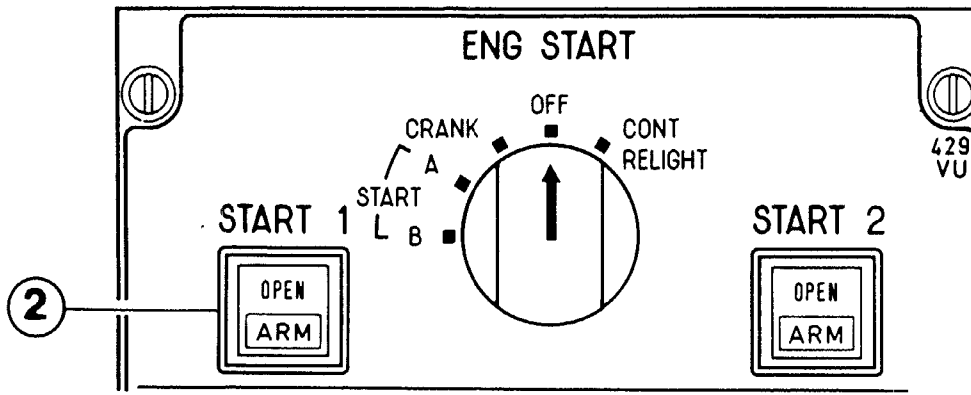
Ignition (ENG START) Selector Switch  
Figure 002

R EFFECTIVITY: 001-100,

PIA

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-2- ENG START 1 (2) PUSHBUTTON SWITCH  
USED TO INITIATE START SEQUENCE OF ENGINE 1 (2)  
RELEASED OUT IS THE NORMAL POSITION  
THE ARM LEGEND (WHITE) COMES ON IF ENG 1 AND 2 N2 > 45% AND ENG START SELECTOR NOT IN  
OFF POSITION.

PRESSED IN : THE ARM LEGEND (WHITE) GOES OFF  
FUEL USED INDICATION IS RESET TO ZERO FOR ENG 1 (2)  
START VALVE OPENS. THE OPEN LEGEND (BLUE) COMES ON AS LONG AS ENG 1 (2)  
START VALVE IS NOT IN FULLY CLOSED POSITION.  
APU (IF RUNNING) PROVIDES MAXIMUM AIRFLOW.

BM5 74 30 00 0 LEMO - 13 - 07  
DM5

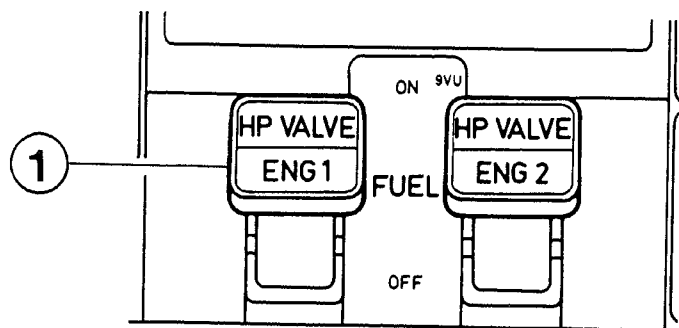
ENG START/START 1(2) Pushbutton Switch  
Figure 003

R EFFECTIVITY: 001-100,

PIA

**74-30-00**

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1. HP FUEL SHUT OFF VALVE CONTROL LEVER
- ON - PERMITS IGNITION CIRCUITS OF CORRESPONDING ENGINE TO BE ELECTRICALLY SUPPLIED.
  - OFF - IGNITION SYSTEMS A AND B OF CORRESPONDING ENGINE INHIBITED
- NOTE** - THIS LEVER ALSO CONTROLS THE FUEL SUPPLY TO THE COMBUSTION CHAMBER (REF. 76.00.00)

BM5 74 30 00 0 LGMO - 13 - 07  
 DIM5

HP Fuel Shut Off Valve Control Lever  
 Figure 004

R EFFECTIVITY: 001-100,

PIA

74-30-00